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Vol. I.

No. 4.

PHONOGRAPH

A MONTHLY MAGAZINE

DEVOTED TO

THE SCIENCE OF SOUND . .

AND

. . RECORDING OF SPEECH.

PUBLISHED BY
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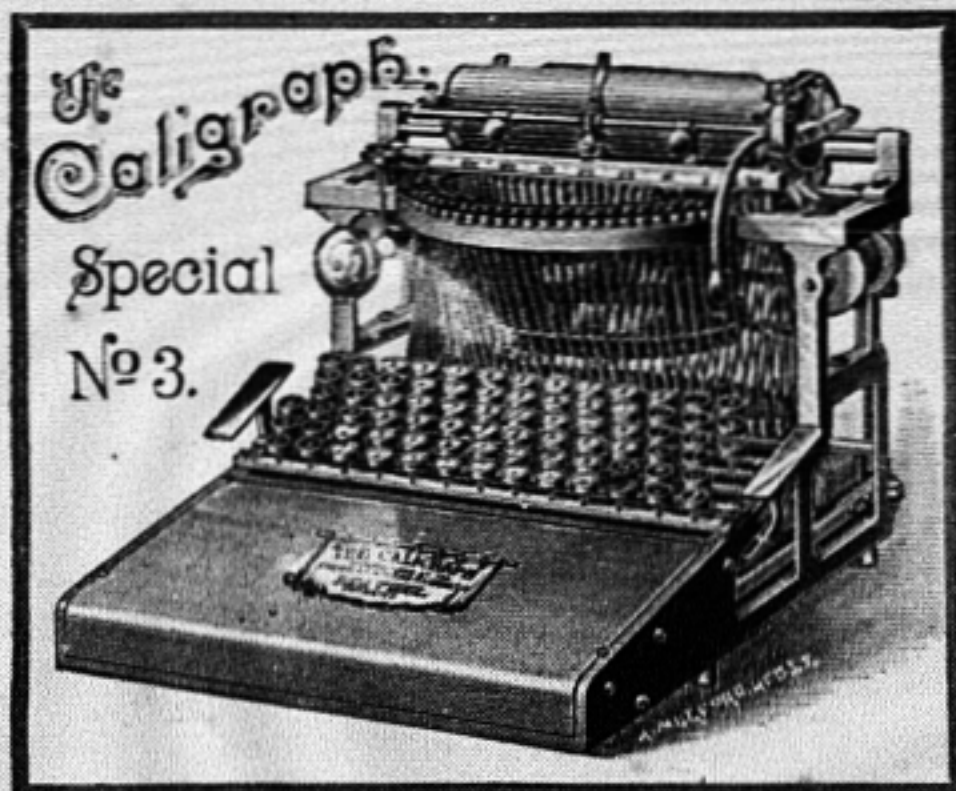
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THE PHONOGRAM

Vol. I.]

◁ APRIL, 1891. ▷

[No. 4.]

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relating to the Phonograph, Typewriter, or Electricity, in any of their practical applications, is cordially invited, and the coöperation of all electrical thinkers and workers earnestly desired. Clear, concise, well-written articles are especially welcome; and communications, views, news items, local newspaper clippings, or any information likely to interest electricians, will be thankfully received and cheerfully acknowledged.

The Present Position of the Phonograph and a Résumé of Its Merits.

A LETTER recently received from Mr. E. D. Easton, President of the Columbia Phonograph Company, presents so many valuable points to all who are interested in the phonograph, and so entirely coincides with us as to the management and intrinsic excellence of this instrument, that we cheerfully give space for the publication of his ideas, and the information he therein imparts.

He says:—Early in April, the first phonograph was placed with the United States Civil Service Commission for trial by the Commissioners and Secretary Doyle. In a few days, an official order came for four instruments on regular rental. The dictators and transcribers became enthusiastic

as to its labor-saving qualities, and the Commission gradually learned to appreciate its value. The President of the Commission, after learning to use the phonograph practically, uttered the following opinion: "This will do away with our examinations in stenography." It is now only a question of time as to conducting regular examinations in this branch of knowledge, and experts from all sections of the country will find its acquisition the stepping-stone to official appointment.

On March 14th, the Bureau of Republics, an organization supported by the United States and the republics of Central and South America, rented two phonographs.

Postmaster-General Wanamaker recently investigated the operation of the phonograph, and before leaving Washington recommended its use to General Whitfield whom he had appointed Acting Postmaster-General in his absence, while accompanying the President on a tour through the country. General Whitfield had not at that time seen the instrument, but having ordered the phonographs, they were delivered April 14th, and both he and his secretary, Mr. Barnes, mastered the instrument in a single lesson, and the latter gentleman states he prefers transcribing from it rather than from shorthand notes. Four officials in the Post-office Department, where there are more good dictators than in any other at Washington, have taken eight phonographs. It is clearly demonstrated that these instruments should be rented in pairs where much business is done. The dictator's phonograph is fixed in the centre of his desk about fifteen inches from the front, an aperture large enough to admit the motor having been cut in the desk. A table is furnished to the transcriber, upon which his instrument is placed.

In the spacious and magnificent music-room of the Postmaster-General at his private residence,

phonograph entertainments have been held by his family for the pleasure of distinguished guests, who manifested warm appreciation of the amusement.

The musical author, Professor Sweney, who has charge of the singing in Mr. Wanamaker's great Sunday-School in Philadelphia sang a single piece, and then sang others into the instrument which the audience were thus enabled to compare;—in this way he too could experience the novel pleasure of *hearing himself sing*.

But the public are now beginning to recognize the important fact that the chief use of the phonograph is its practical labor-saving use in business, and the great army of stenographers, who were at first its bitter enemies, have now become its close allies and friends, and that for the following reasons:

1st. The phonograph will repeat whatever is desired an indefinite number of times, which dictators refuse to do.

2d. Its reproduction by sound of the records traced on cylinders is never inaccurate. It makes no mistakes.

3d. Dictation can be taken with the phonograph as fast as a speaker can articulate. No shorthand writer can do that.

4th. A stenographer finds many words and even whole sentences which he has written in shorthand, frequently quite illegible, while with the phonograph you do not lose a word.

5th. The pauses and varying tones of voice assist the transcriber in punctuating, and proper names and technical phrases are repeated distinctly.

6th. Any person of ordinary mind can familiarize himself with this instrument in two weeks. Besides all these, there are advantages in the saving of time and expense of tuition that are of great importance.

The most expert stenographer in the world is Mr. Murphy, who reports for our American Congress. He testifies, in a letter that will be found on another page, "it would be impossible to do the Congressional work at present *without a phonograph*."

It is now apparent that the PHONOGRAM, which is the official organ of the phonographic companies throughout the country, and, indeed, throughout the world, has been the medium by which the policy of training typewriters to the use of this instrument has become universal. Its central light has irradiated an immense area, and carried wisdom and intelligence on this subject wherever it has penetrated.

V. H. McRAE.

The Lippincott Assignment.

As we go to press we learn that Mr. Jesse H. Lippincott, President of N. A. Phonograph Co. at No. 10 Wall Street, and sole licensee of the American Graphophone Co., has made an individual assignment to Frederick S. Wait, giving preferences to the Rochester Tumbler Co., Harriet D. Lippincott, Anna M. Lippincott and Sarah H. Vance, his sisters, all of Pittsburgh, for \$6,760 each, and Mr. J. Adriance Bush, for \$5,000.

The liabilities are about \$500,000 and the assets \$400,000, in stock of the companies in which he was interested.

Mr. Lippincott was stricken with paralysis last fall, and has been confined to his house ever since.

We regret to hear of his failure, because he spared neither money nor pains in pushing the stock of the companies, and borrowed large sums for this purpose, expecting a rise in the price of stocks, which, however, did not meet his expectations. His own means being tied up in these stocks, and his personal obligations being so large, he found he could not meet them as they matured, and, therefore, made the assignment.

Mr. Lippincott was one of the organizers of the Rochester Tumbler Co., of which he has since continued to be treasurer. His investment in it being placed at \$100,000.

He came to New York three years ago, bought the United States and Canadian patents of Thomas A. Edison to his phonograph, and then contracted with Mr. Edison to manufacture it.

He paid Mr. Edison \$500,000 for these patent rights, and \$250,000 to Ezra T. Gilliland and John C. Tomlinson, who were interested with Mr. Edison in the phonograph business.

Mr. Lippincott also invested \$200,000 in the American Graphophone Co., and purchased \$262,000 for the Edison Speaking Phonograph Rights, and for other patent-rights and interests \$167,000, making a total of \$1,329,000.

The North American Phonograph Co. was organized in July, 1888, under New Jersey laws, with a capital stock of \$6,000,000. This company has sold territorial rights to about 30 companies.

The failure of Mr. Lippincott does not at all affect the business of N. A. Company.

The phonograph is daily making great strides toward popularity, both in commercial houses and in amusement resorts; and when we take into consideration the length of time that elapsed before the telephone was successfully placed on the market, we cannot but feel gratified to see the great progress that has been achieved with the phonograph. It only requires persistent effort on

the part of all concerned to push this most valuable commercial commodity, when we will find that the N. A. stock will again be listed at par.

The business of the parent company is going right on under the management of its Board of Directors—Mr. T. R. Lombard, Vice-President, being the executive in control.

Testimonial of D. F. Murphy.

OFFICIAL REPORTER'S OFFICE,
UNITED STATES SENATE,
WASHINGTON, D. C., May 9, 1891.

E. D. EASTON, ESQ.,

President Columbia Phonograph Co.

DEAR SIR: During the last session of Congress there were used in my office three phonographs—one for dictation and two for transcription.

Dictation to the phonograph requires less effort, and is altogether more easy and satisfactory than dictation to the shorthand amanuensis.

No matter how high the rate of speed at which the reporter reads his notes to the phonograph, he is never stopped by questions, never asked to repeat a sentence, and has always the assurance that every word which is enunciated will be faithfully reproduced. He is thus enabled to proceed without distraction or interruption, and to recast sentences, which, as originally uttered and reported, were involved and obscure.

It would be impossible for the most expert stenographer to produce a faithful report at the high rate of speed at which matter frequently is spoken into the phonograph.

I think it entirely safe to say that by the use of the phonograph at least twice as much copy can be turned out in a given time and in better shape than by the use of the most skillful shorthand amanuensis, particularly where the hours of labor are so long as to occasion mental and bodily fatigue to the amanuensis. The advantages of this nerveless and tireless little machine cannot be overestimated, for it is always ready to respond to the demands made upon it.

So indispensable has the phonograph become to the business of my office, that the wonder with myself and associates now is, how we were able heretofore to get along without it.

Very truly yours,

D. F. MURPHY,

Official Reporter U. S. Senate.

Novel Experiments with the Phonograph.

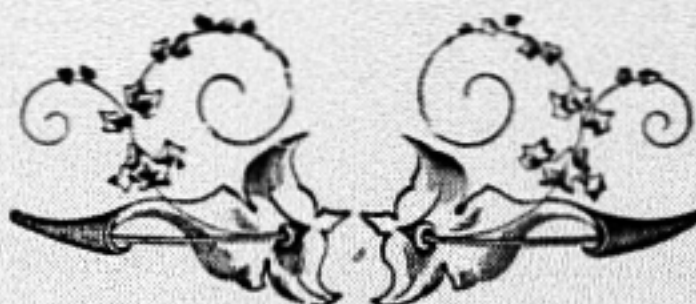
A LEARNED professor at the Smithsonian Institute has recorded on the phonographic cylinder the chatter of monkeys; and, after careful practice of the sounds, he finds that, by repeating them, he can make himself understood by the animals. Sounds expressive of fear, cold, hunger, and other sensations common to the human race and its four-footed brethren, have alone been recognized.

It is asserted that there are forty different sounds in this Simian vocabulary. The readers of romance will recall a certain African tale, for which Mr. Rider Haggard is responsible, in which he severely taxes the credulity of his readers by stating that a child had been reared by monkeys, could receive and communicate ideas to them, and was able to influence their acts and movements.

These investigations are valuable from a scientific standpoint, and will form the basis of a new line of speculation in the future.

THE death of Mr. F. E. Clarkson, General Manager of the Louisiana Phonograph Co., on March 25th, at New Orleans, La., was a great blow to his many friends and associates in the Phonograph Companies.

Frank Edward Clarkson was born in Amesbury, Mass., September 11, 1858. When quite young he engaged in the telephone business, and managed a large district, which included Lynn, Mass.; then went to South America, as manager of the West Coast Telephone Co., remaining two years. Mr. Clarkson was very active in the business of the Cahoon Syndicate. He placed the stock of the Metropolitan Phonograph Co., and the Minnesota Phonograph Co., afterward going South to help organize the Georgia Phonograph Co., becoming its superintendent, remaining two years; then going to New Orleans to manage the Louisiana Company. Last year he took a very prominent part in the Chicago Convention, and had a most promising future before him, and was one of the most progressive, intelligent and successful managers in the field. His death is not only a great loss to the Louisiana Co., but to the interests of the phonograph throughout the country. Under his management the Louisiana Company had as bright a future before it as any company in the United States. Mr. Clarkson was well known to every prominent phonograph man in the country.





PHONOGRAPHIC POSSIBILITIES.

BY WILLIAM ADDISON CLARKE.

THERE are drawbacks and encouragements at the inception of every great enterprise.

The history of invention is flecked with disappointments and heart-burnings. Often the creative genius has not lived to see his life-work realized in success.

Howe was a martyr to his own greatness in his earliest efforts to launch the sewing machine. Arkwright was mobbed and his valuable models destroyed by the fanatics that viewed his loom as the forerunner of beggary of the working people.

Already, we find cavilers carping at "the machine that talks," ready to relegate it to the realm of chewing-gum and fortune-telling, merely because, with commendable foresight, the genius of the electrical wizard has put in the cylinders and placed it on tap at five cents a listen.

It is, perhaps, not altogether conducive to the higher aims and nobler uses of the phonograph to cause its initial exploitation as a catch-penny adjunct of the saloon-keeper, but, on the other hand, it brings it, in these public places, before the public eye, where its simplicity and wonder-creating functions will quicken the public pulse to a superficial contemplation calculated to de-

velop a serious consideration of its possibilities in the world of affairs.

To treat the phonograph as a mere toy is to make light of its mission, but as the medium of presenting it in attractive form to the attention of the multitude, the nickel-in-slot device has not only its palliation, but is a factor for good.

As a linguist "the machine that talks" has no equal. It will repeat every dialect and *patois* spoken anywhere, even at the furthest corners of the earth. To augur for its future would be to claim a far-reaching scope and world-wide efficiency. In its construction and dissemination, millions of dollars will be yearly expended, for it is certain to become, in course of time, an essential appurtenance in the artistic and work-a-day world.

Of the present impregnable position of the phonograph, the story of its progress has an Aladdin-like tinge.

A résumé of the cardinal uses to which it may be directed need not be made, but there are many new and interesting phases of its increasing beneficence that give portent of a prospective range in ramifications that will become almost limitless as the years roll on.

It may be, tritely speaking, in many ways the forerunner of reforms where there has been a long-felt want. It is utilitarian and artistic in the highest sense in its proper adaptation.

In the nature of a suggestion that would be a boon indeed to the millions of passengers upon the elevated railroads, the idea is offered of having a phonograph placed in the centre of the car so that every one should hear the announcements called out at the stations, the guards merely pressing the electric button from the platform. The undistinguishable yells that are now the method, is a bane of urban travel in the nature of a positive affliction.

As an advertising factor in this way, the phonograph suggests measureless possibilities. Fancy it placed in the street cars to call out the various shops along the leading thoroughfares, or located in the prominent public resorts to announce the list of the evening's amusement at regular intervals.

Along the routes of picturesque travel by rail the phonograph might be placed in the open observation cars and, with a current communicated from the track at certain positions, before points of interest were reached, narrate a short description of the locality. Thus the trips could be enhanced as though the passengers were enjoying the discourse of an expert of the company familiar with all the scenic features of the route.

In time of war the waxen cylinders may be enclosed in projectiles and fired from distant points to tell the story of different moves in the campaign; they may be sent in balloons or parachutes, for these methods in aerial artifices have been proven practicable.

There is little doubt but that its mechanism will be in the near future so delicately perfected as to warrant its adjustment to the long-distance telephone in the reception of messages that may be subsequently taken from it at the volition of the lessor.

These are a few of the possibilities that

come to mind. There are countless applications awaiting the "machine that talks."

The phonograph may well be included among the seven wonders of modern science.

It is the brain-saving concomitant of the hour.

An Interview with the Great General Von Moltke.

It is a tribute to the merits of the phonograph that such a man as the renowned head of the army of Germany should become interested in its operation. Men whose talents enable them to decide the fate of empires, do not always find the time to inspect or become acquainted with the results of ingenious mechanism. Their occupation is to control the movements of men, to take part in those events which change the destinies of nations, and unless an instrument possesses qualities of a striking character, they would not be attracted by it.

In the *Sunday World* we read an account given by Mr. Wangemann, of his exhibition of the phonograph at Castle Creisau, the usual residence of General von Moltke. Nearly two years since this interview occurred, and when the old hero heard the voices of the Emperor and Prince Bismarck, he smiled, and remarked that "the instrument was a grand one, and would enable the dead to speak to the living."

Accuracy of the Phonograph in Acoustics.

DR. WANGEMANN, Mr. Edison's representative, when in Paris, called on Madame Marchesi, the celebrated teacher of singing, and suggested that the phonograph might be used as an aid in vocal teaching, and would render certain distinctions and shades of tone which escaped the unaided ear. Madame Marchesi replied that her ears had been cultivated by thirty-five years' attention to acoustics, and she could trust them entirely in discovering inequalities of tone. The Doctor, however, finally persuaded her to allow twelve of her pupils to sing an ascending and descending scale into a phonograph, when, to her surprise, she perceived that the inaccuracies of tone were marked.

THE COLUMBIA PHONOGRAPH CO., WASHINGTON, D. C.

THE Columbia Phonograph Company, controlling Maryland, Delaware, and the District of Columbia, was organized in January, 1889. For the first year of its existence machines could not be freely obtained, the company remained in temporary offices, and not much progress was made. When the supply of instruments was ample, the company removed to the handsome five-story and basement brown-stone building, 627 E Street, North West, Washington, D. C.

Since that time the business has been vigorously and successfully pressed. The officers are as follows: Edward D. Easton, President; William Herbert Smith, Vice-President and Treasurer; R. F. Cromelin, Secretary. The directors are Messrs. Smith, Easton, Chapin Brown, Benjamin Durfee, and Charles H. Ridenour.

None of the stock was ever offered to the public, it being almost entirely in the hands of the officers of the company, who, therefore, have a double incentive to successful effort.

Business is being actively conducted in Baltimore, Wilmington, Del., Frederick, Hagerstown, Annapolis, Frostburg, and Cumberland, Md., as well as in Washington.

Although the company has had but a little over a year for work, since machines and supplies could be freely obtained, it has already paid four dividends out of earnings, the last on March 23d. It has paid from

the beginning—never having been obliged to trespass on its capital. The policy of the management has been to make expenses less than receipts, under all circumstances.

The following comparative statement shows the receipts from rental of machines and sale of supplies for a single month in the three years named, excluding collections from nickel-in-the-slot phonographs, of which the company has 126:

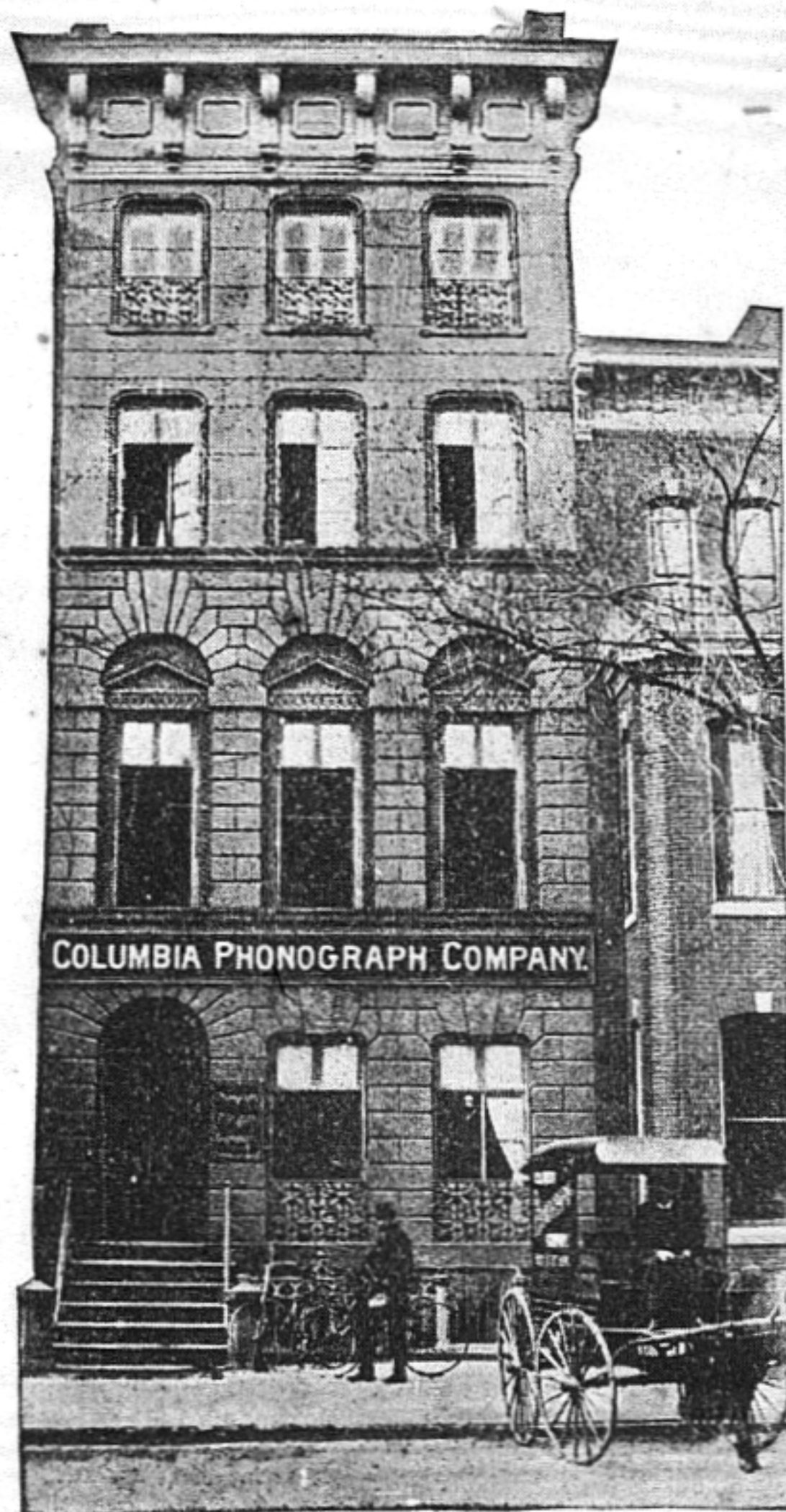
Jan., 1889,	\$110.00
Jan., 1890,	1,563.45
Jan., 1891,	3,720.86

The main office of the company in Washington is located in the centre of the city, within a quarter of a square

of the general Post-Office Department, and within a single square of the Patent Office.

The display parlors, where the public transact their business, are the handsomest used for the purpose in the country. The accompanying cut shows a portion of these magnificent rooms.

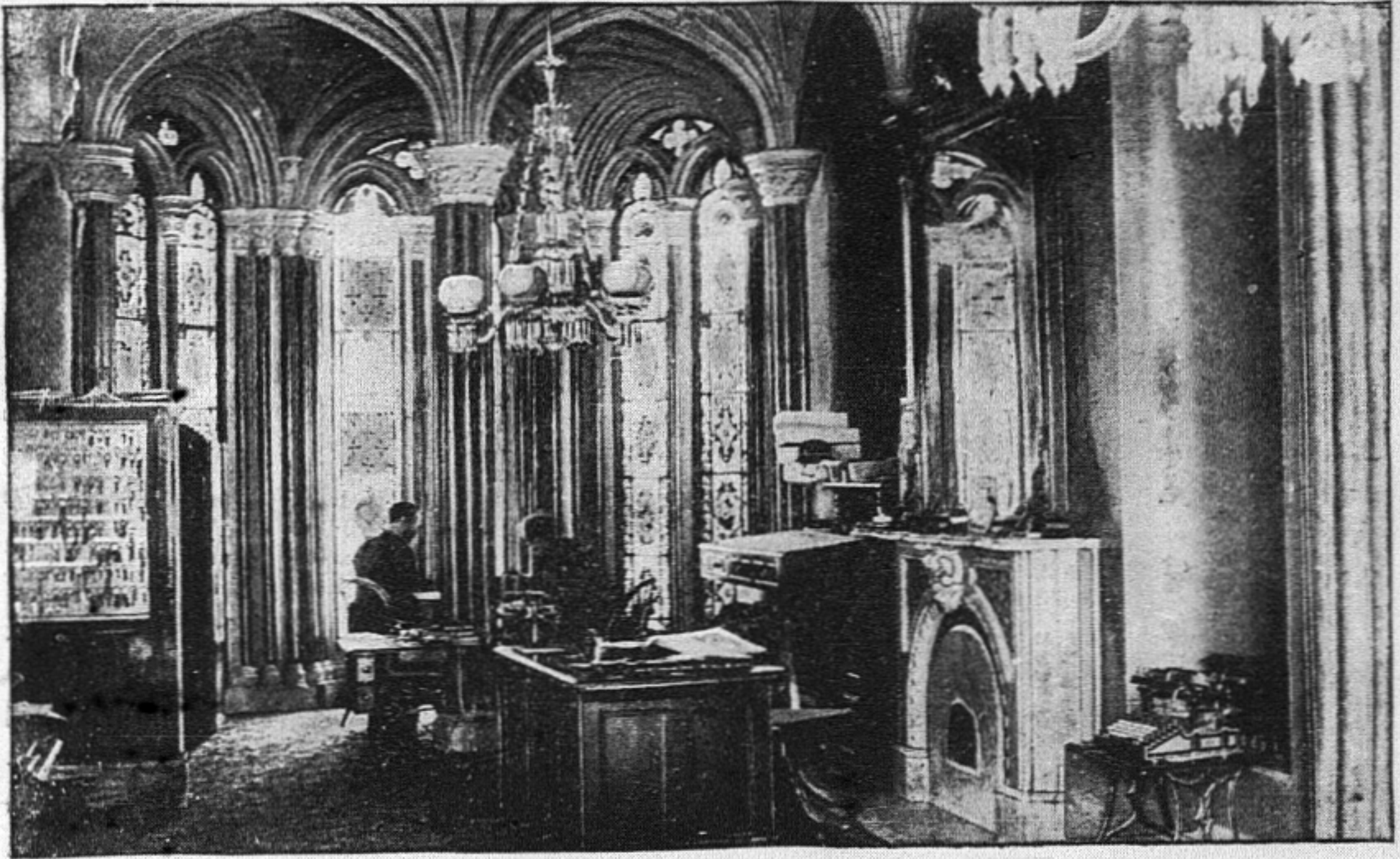
On the first floor are the rooms of the



President and General Manager. The basement is utilized for the electrical department and for repair work. The display parlors are in the second story; the third floor is occupied by the musical department, from which records go to all parts of the United States, and the rooms above for storage, etc.

Passers-by on the street are daily greeted by the sweetest strains of the world-renowned Marine Band, or the Third Artillery Band, or, perhaps, by the music of the eminent vocalists, instrumental soloists, etc.,

the phonograph. Dr. Richard S. Rosenthal, the well-known author of the Meisterschaft system, supervises this department—having transferred his headquarters from Boston to Washington for this purpose. In addition to sales of cylinders covering any desired language, of which the company has a considerable wholesale and retail business, Dr. Rosenthal has opened, on the corner of 13th and F streets, a School of Languages. There, at any hour of the day or evening, pupils may be seen gathered about phonographs, studying, with books in hand and



PARLORS.

who are secured for record-making, and who do their work in this building.

The inspectors, both of commercial and automatic phonographs, are mounted on bicycles, and thus go swiftly from place to place over the smooth concrete streets of Washington. Several of the bicycles used by the company are shown in the illustration.

For some months past the Columbia Company has been giving earnest attention to the development of language-teaching by

tubes in ears, the phonograph educating the ear while the book educates the eye. A visit to this language club is one of the most interesting sights of Washington.

The phonograph has made more progress in Washington, in office and home-use, than in any other city thus far. During the session of Congress between fifty and sixty machines were used in the Capitol alone, by Senators, Representatives, officials, etc. Every department of the Government is now supplied. In the homes of men of

wealth and culture the phonograph is already a fixture.

The phonograph is also used at the Washington Light Infantry Armory in order to determine whether it is not feasible for the purpose of drilling the companies. General Ordway is much interested, believing that it will be invaluable in teaching the men the correct step. The object is an economical one only.

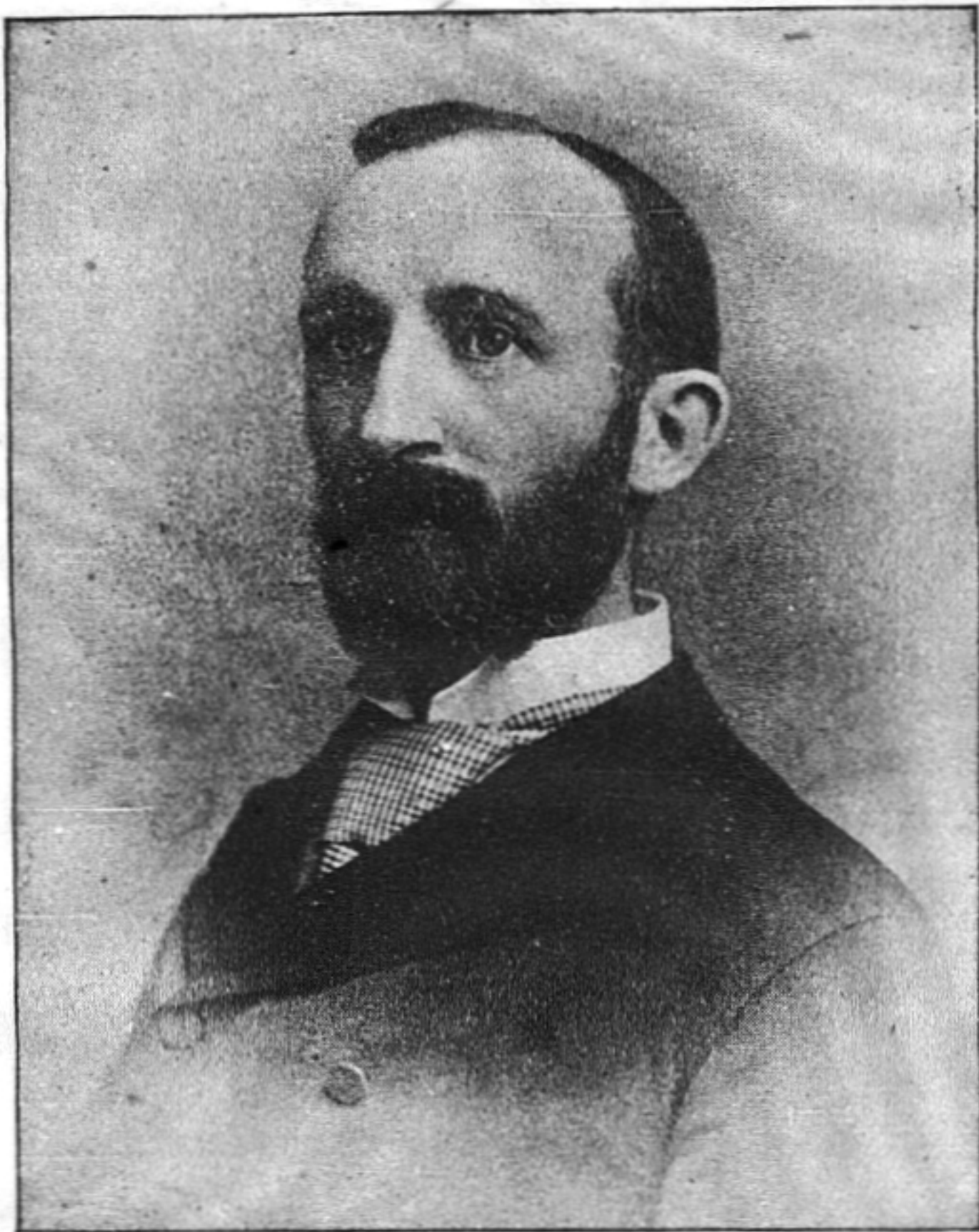
When the phonograph was first introduced, poor stenographers and type-writers thought it would ultimately drive them out of the business, and raised a hue and cry about its talking too fast; but, of course, this disparagement of the wonderful machine has now all vanished. It does not injure the business of stenographers, but tends to elevate the profession.

The selections from the Marine Band are known throughout the country, and orders are very large for this special class of musical cylinders.

Mr. Edward D. Easton, the President and General Manager of the company, was born in Gloucester, Mass., April 10, 1856. His parents moved to Brooklyn, N. Y., in 1860, where he was brought up. He has had several years of newspaper experience, and, up to the organization of the company, he was a law and general shorthand reporter, being also a member of the bar of the

Supreme Court of the District of Columbia. Mr. Easton was the official reporter of the Guiteau and "Star Route" trials as well as of nearly every other case of national importance tried in Washington during the last ten years; has served as a reporter of debates in the House of Representatives, reporter of various committees of Congress, of cases in the United States Supreme Court, etc. He was one of the original

stockholders of the American Graphophone Co., which was organized June 22, 1887, and is a director in that company. He recently visited every phonograph company in the United States—a trip of some 13,000 miles—and is personally acquainted with the officers of every company. His practical experience with talking-machines dates back sixteen months before the North American Com-



EDWARD D. EASTON.

pany was organized. He took with him into the service of the Columbia Company his office employees, who were already experienced in the use of advance machines, made in the laboratory of the American Graphophone Co.

Mr. William Herbert Smith, the Vice-President and Treasurer, was born in Mount Vernon, Ohio, January 8, 1860. He is a member of the bar of the United States Supreme Court, and has also had large

experience in shorthand reporting. He, too, used the graphophone practically long before the Columbia Company was organized. Upon the occasion of the recent convention of phonograph companies in Chicago, Mr. Smith reported the proceedings by repeating in a low tone into a graphophone all the speakers said. The cylinders were then sent by express to Washington, accurately transcribed and printed, without further attention on Mr. Smith's

part; and the experiment demonstrated that reporting can be done much more readily and accurately in this new way than by any other yet known.

Mr. R. F. Cromelin, the Secretary, was born in New York City, April 1, 1857. He was also a shorthand writer. At the time of the organization of the Columbia Company Mr. Cromelin was stenographic secretary to Gov. Beaver, of

Pennsylvania. He had, in the Executive Chamber, at Harrisburg, previous to entering the work regularly, a considerable practical experience with the graphophone, and, therefore, did not come to the business untrained.

Mr. Cromelin thoroughly understands the application of the phonograph to business; and the great success he has had in training dictators and transcribers has resulted from

the thorough and painstaking manner in which he does his work. When a phonograph is rented, he follows it to its destination, sits by the dictator while he is disposing of his mail, sees to it that the cylinders are handled in the best and most expeditious manner, follows them to the transcriber's instrument, trains the transcriber carefully in detail, shows the easiest and most satisfactory way of manipulating the phonographs,

and thus commands success.

Mr. Cromelin's latest official work was to explain to the officials of the Post-Office Department and to the Civil Service Commissioners the use of eight phonographs that have just been ordered for those branches of the Government. These rentals complete the list of U. S. Departments, all of which have been supplied to a greater or less extent.

While the Columbia Company will wel-

come a new machine, if it contains any important improvements, yet it is well satisfied with the material now at hand, and is moving rapidly forward on the road to prosperity.

Any one acquainted with existing conditions at the centre of the "Phonograph system" in Washington, will at once perceive that there is evidence of much life here. This is doubtless the result of



WILLIAM HERBERT SMITH.

two causes: the first of which is the effect of good business management, which involves not alone commercial knowledge, correct book-keeping, strict punctuality and continuous, thorough investigation of affairs at the helm, but an insight into men: that instinct which teaches one whom to approach, how to create such an interest as will prompt persons to examine the instrument, to listen to explanations, learn all its uses and the methods employed in using it.

The second cause is the favorable atmosphere of the locality; and here we employ figurative language. Our meaning is that the population of this city is largely made up of persons engaged in intellectual pursuits and avocations, who would be more likely to need and to use, from generation to generation, this instrument, than any other in the United States. When one comes to think of the definition of the word government, a perception gradually looms up before us, like the mist in the Arabian tale, which issued from a vessel and grew in volume and density till it assumed the shape and dimensions of a giant. Here we have Congress, with its twin assemblies, its horde of employés, reportorial, observant, critical, curious, attendant; then the Executive with its satellites; then the Supreme Court—a

comet with a long tail; then the Heads of Departments—each one of which, especially the Post Office and Treasury have an immense following; then the representatives of every country in the world, each surrounded by a small court; then the inferior law courts, and last, but not least, the Pension and other bureaus and all public institutes.

This is, per se, an extensive field for the

phonograph at present; yet it is growing yearly. And, moreover, the value of the instrument will become more widely known here than in other cities, because the communication held from the seat of Government with a foreign sphere is much larger than elsewhere. These advantages are so apparent, that further details would be useless. It is a case in which "he that runs may read."



R. F. CROMELIN.

For the Benefit of Posterity.

CARDINAL MANNING has sent phonographic cylinders to Archbishop Corrigan and to Mr. Edison. His eminence has also spoken into one which has been deposited in the archbishop's residence, at Westminster, for the benefit of posterity. The American messages will be treasured in the same way. Mr. Moriarty, the genial manager of the United Phonograph Co., Mills Building, has just received a cylinder intended for Cardinal Gibbons, and which has been forwarded to that eminent divine. They will be preserved in the archives of the cathedral for future generations.

The Phonograph of the South Seas in the Seventeenth Century.

COL. DE ROCHAS, in a communication to the *Revue Scientifique*, gathers some interesting data about the phonograph in the seventeenth century, together with other scientific reveries of that period. He says that the electric telegraph was dreamed of by Strada in some of his verses of the *Pro-lusiones Academicæ*, published at Rome in 1617. It was for him a mere *jeu d'esprit*, a simple wish:

"*O! utinam hæc ratio scribendi prodeat usu,
Cautior et citior properaret epistola.*"

The idea he conceived was that of our late dial telegraph; but the *nexus*—the wire—was missing. As to the phonograph, it is thus referred to in the number for April, 1632, of the *Courrier Véritable*, a little monthly that published fanciful contributions and light reading:

"Captain Vesterlook, in command of a vessel for the States of Holland, has just returned from the Southern Seas, after an absence there of two years and a half. He relates that below the Straits of Magellan he landed at a spot where the natives use certain sponges which have the property of retaining sounds and the articulate voice, just as our sponges do liquids. So that when they wish to send for anything, or forward any message, they simply speak into one of these sponges, and then send it to their friends, who, after receiving it, take hold of it gently and squeeze out of it all the words it contained, and learn in this remarkable way all that their friends had wished to communicate." Cyrano de Bergerac is still more precise in his *Comic History of the State and Dominion of the Moon*, published in 1650. This writer also speaks of transparent balls which served the purpose of illumination. A light was fixed in each ball, and it gave no heat. He likewise indulges in speculation on microbes.

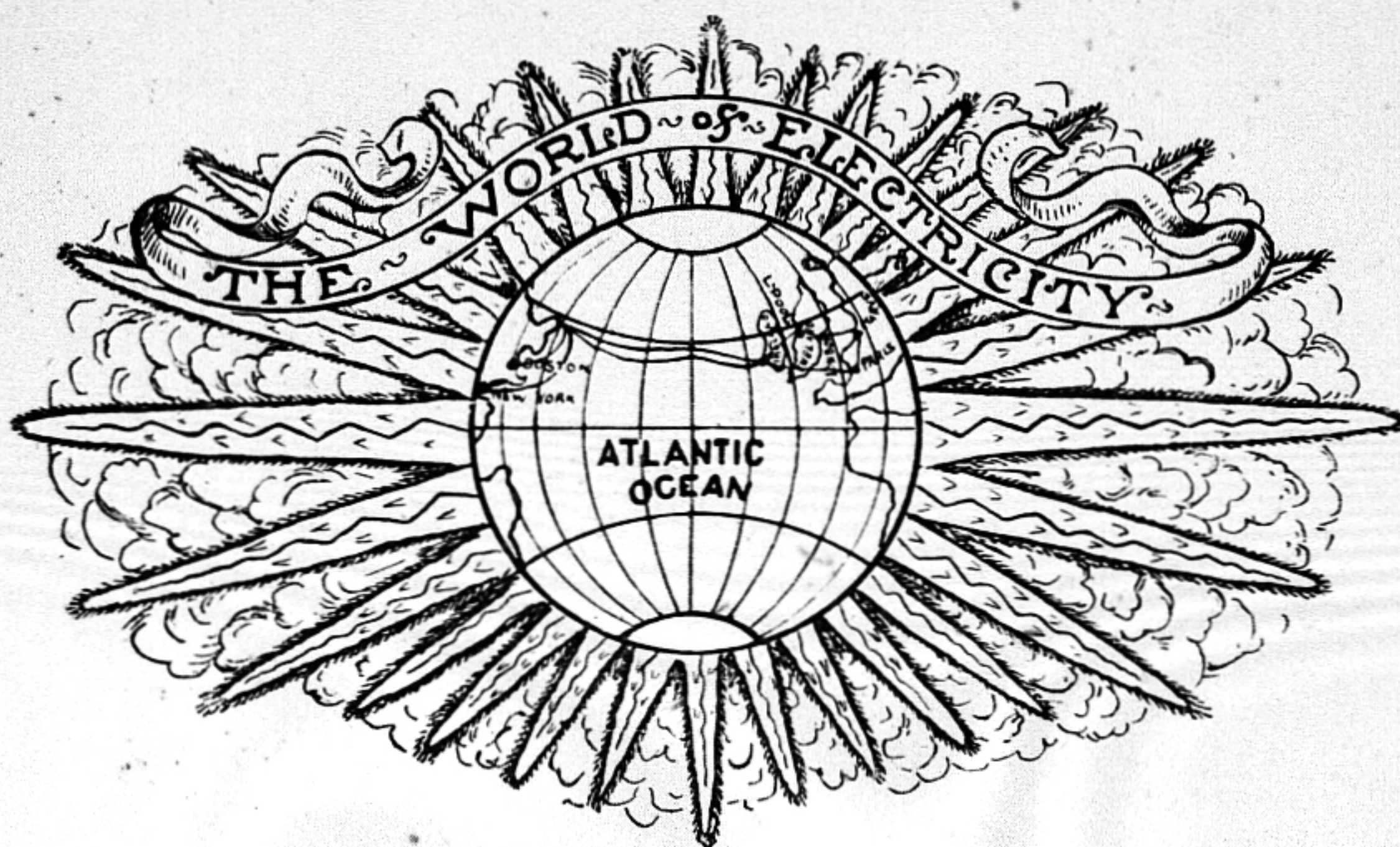
Col. De Rochas concludes his account with the saying of Beaumarchais in the *Mariage de Figaro*: "*Vieilles folies deviennent sagesse, et les anciens mensonges se transforment en belles petites vérités*" ("Old-time folly has become wisdom, and the lies of long ago are turned to nice little realities").

Foreign Notes.

THE opening of the telephone service between London and Paris is the subject of many illustrations and special mention in the European papers. The charge for an ordinary conversation is eight shillings—equal to two dollars in our money. England, France and Germany are at last taking a more active interest in electrical matters. This is as it should be; for the first financial support of the Field Atlantic Cable Company came from English capitalists, but not until Cyrus W. Field had connected the telegraphic systems of the European States together, and sent a continuous message over two thousand miles under water and over land, and received an answer back over the same circuit, that the English capitalists came forward and subscribed for the stock. After this had been secured Mr. Field returned to the United States and made up the American company.

The estimated telegraph revenue of England for the year was £2,800,000—equal to \$14,000,000 in our currency. Cable rates to Australia will be reduced one-half after May 1st. The new phonograph which Edison has perfected will be first introduced in London and Paris—as the American territory is already secured under a former contract made with the North American Phonograph Co., which owns all the machines in America, and leases them to the sub-companies, of which there are about thirty-two, for twenty dollars each. The sub-companies in turn sublet to corporations and private parties for about sixty dollars per annum. The amount of capital now interested in phonographs exceeds twenty millions of dollars.

The town of Hammerfest, Norway, has just put in an electric plant. It is situated in latitude 70.5 degrees, and for many months in the year the sun does not shine, so that the introduction of twelve *electric suns*, in the shape of arc lamps, is a great triumph for science.



WHAT ELECTRICITY IS DOING FOR THE SAILOR

BY S. D. GREENE, LATE ENSIGN U. S. NAVY.



LARGE proportion of the people of this country are unfamiliar with the many discomforts and hardships of those whose business it is "to go down to the sea in ships." The sailor is more or less cramped and crowded in his quarters: he sleeps in a hammock or bunk, just large enough to accommodate his body; he stores his clothes in a space about one-half the size of an ordinary clothes press; his food is plain—often poor; and yet he takes it all as a matter of course. Fortunately, however, naval architects have been paying as much attention, of late years, to the practical comforts and hygiene of those who are to man the vessels they design, as their brother architects have paid to the same subjects on shore.

Electricity has perhaps done as much as any one agent to make the modern ship more habitable. On the lower decks of a vessel where men are huddled together at night like sheep, every cubic foot of pure air is precious. The old oil lamp, or tallow

dip, besides being a constant source of danger and care, vitiated the air to a very considerable extent, by the consumption of the free oxygen in it. The incandescent electric lamp of to-day does away with all this, and gives a pure, bright light, which can be controlled from any one point, or any number of points. On board of our modern men-of-war, so much importance is attached to the electrical machinery, that it is assigned a whole compartment by itself; is considered as one of the vitals of the ship, and is given as much protection from an enemy's fire as the type of the vessel will allow. The sketch (Fig. 1) shows the arrangement of the "Switch Board" on one of our latest vessels. Owing to the fact that salt water is a deadly enemy of electrical appliances of all kinds, great care has to be observed in the installation of the electric plant on board a ship, to see that every part is *absolutely water-tight*. So important is this, that several electrical companies have now developed, by degrees, a complete set of special appliances for marine work. Some of these appliances, designed primarily to meet the demands of the United States

Navy, are shown in the sketch (Fig. 2). Electricity, however, performs many useful duties on shipboard besides lighting. The electric motor is rapidly taking the place of the auxiliary steam-engine, for pumping, hoisting, driving ventilating fans, steering, training guns, moving the turrets or armor-clads, etc. The advantages of the electric

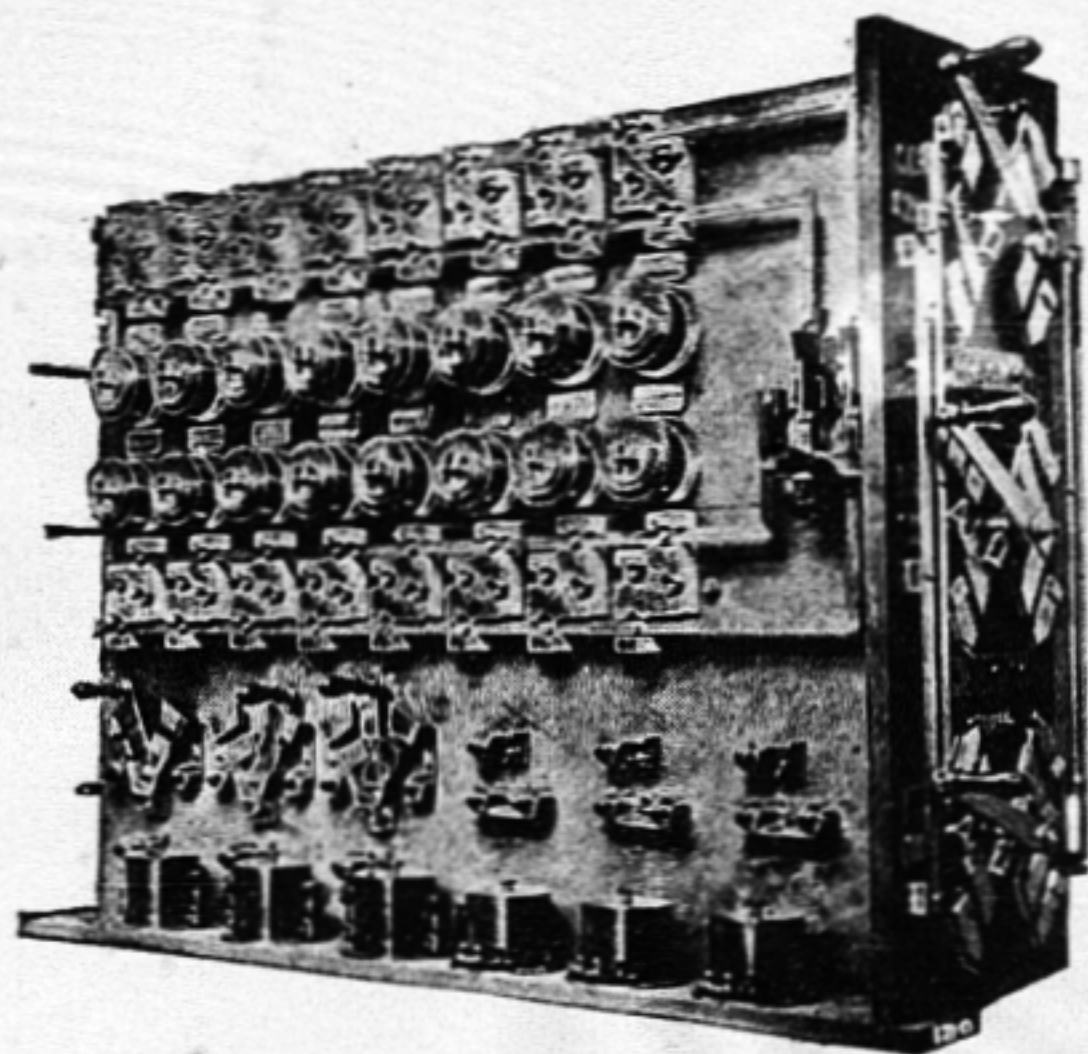


FIG. 1.

motor over the steam-engine for these purposes may be stated briefly as:—

- (1) Occupying much less space for the same power.
- (2) Giving out no heat, noise or dirt, and requiring no skilled attendance.
- (3) Doing away with the expensive necessity of running high-pressure steam and exhaust pipes all over the ship.
- (4) Economy in cost of first installation and subsequent operation.
- (5) Greater ease of manipulation and control.

The electric search-light enables steamers to enter difficult harbors at night with ease, while in foggy weather, its rays, thrown directly overhead, reveal the position of the vessel to approaching vessels.

The telephone and electric call-bells connect the pilot-house and captain's cabin with every part of his ship.

On board vessels of war, the electric gun-firing circuits indicate to the captain, in his

conning tower, when every gun and torpedo is ready for firing, and enables him to fire them if he so desires. The electric counter tells the engineer how many revolutions his engines are making, while the electric annunciator, connected with the bridge, tells him to slow, stop or back his engines.

Vessels at night, instead of burning rockets and lights, may signal each other miles away with their powerful search-lights; or, if they are close to each other, they may telegraph by the Morse Code, using the flashing of incandescent lamps to denote the dots and dashes.

To see the mass of electrical apparatus on board a modern vessel is almost bewildering to the uninitiated, but the sailor and the officer have long since learned to appreciate fully their advantages, and to handle them intelligently.

When a practical method is discovered of converting the energy of coal into electrical energy direct, without the intervention of

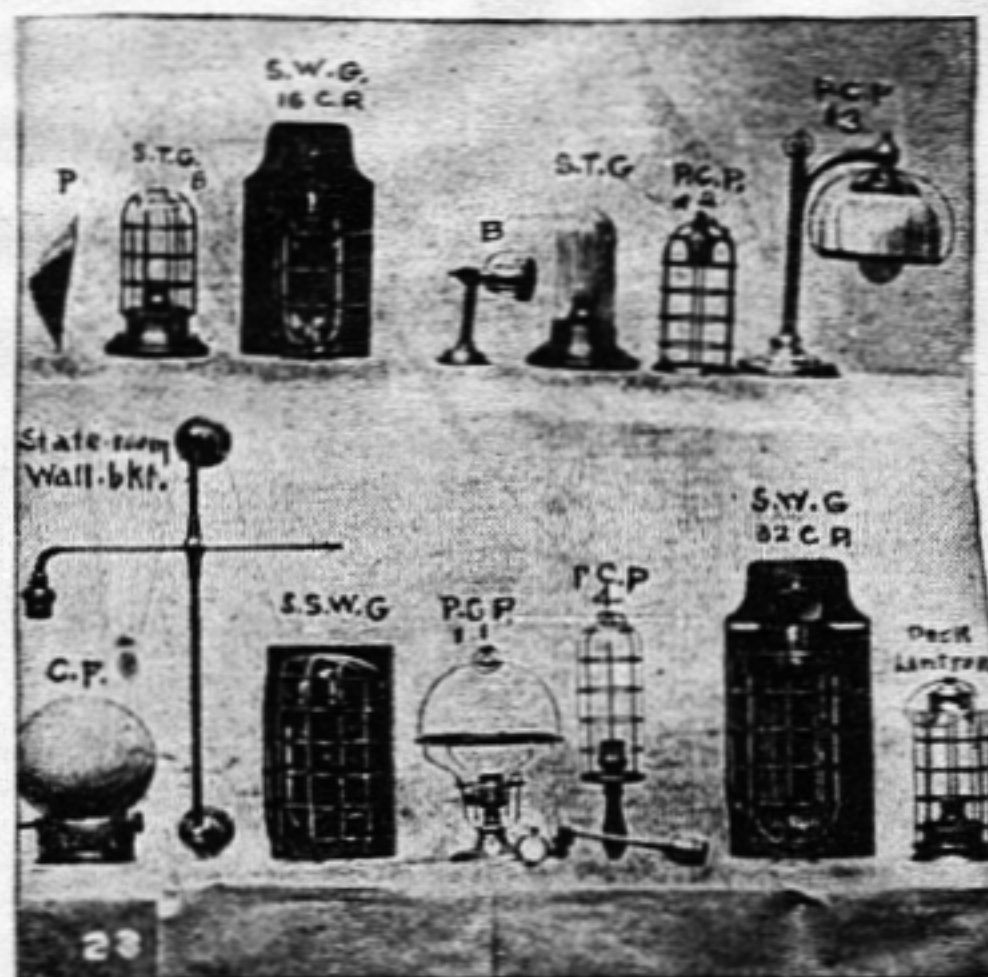


FIG. 2.

boiler and steam-engine (and such a method will be discovered before many years have passed), then indeed will the triumph of the mysterious agent called "electricity" be complete, and we shall see our ocean racers crossing the Atlantic in four days, perhaps, with electricity used as the main as well as the auxiliary motive power.

THE FOUNDERS OF ELECTRICAL SCIENCE.

BY FELIX DAHN, PH. D.

No. 3.—STEPHEN GRAY. 1695-1736.

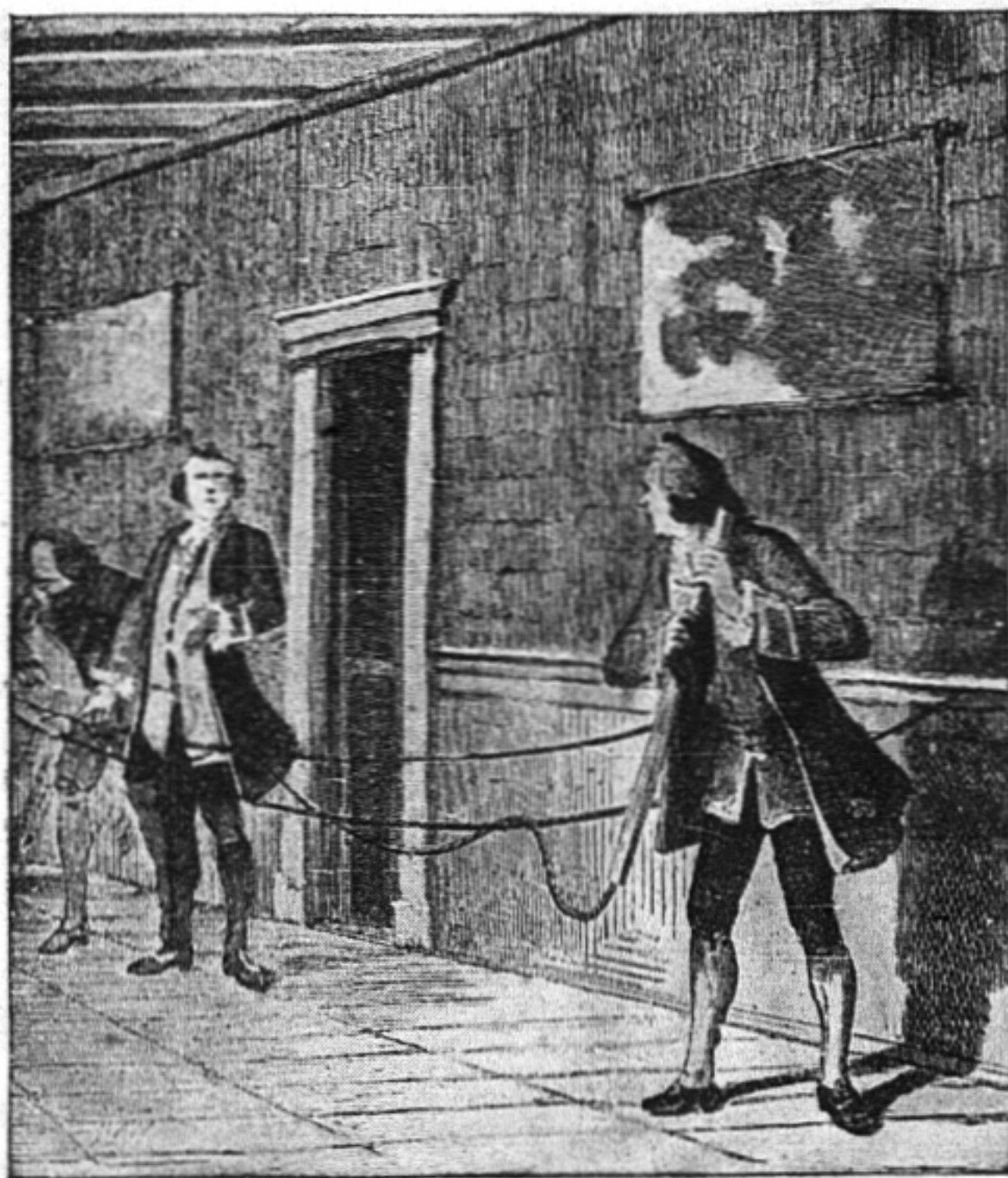
IN the preceding papers we have shown that *Dr. William Gilbert* discovered the infant science, christened it electricity, and in 1600 wrote the first treatise upon it; that about sixty years thereafter *Otto Guericke* first observed repulsion between electrified bodies, invented the *first electrical machine*, and from it produced the first electric spark obtained by human agency. Dr. Wall, in 1708, said: "This light and crackling seem, in some degree, to represent thunder and lightning." Infinitesimal was the degree, but the surmise was true. The results of these discoveries and inventions aroused the attention of the scientific world, and other investigators began to devote themselves to the study of the new and curious phenomena. Most notable and successful among these was Stephen Gray, a Charterhouse pensioner, who was aptly described by Prof. Tyndall as that "most meritorious philosopher."

In order to show how great is the debt that science owes to Gray, and because in all the annals of discovery and invention

we do not recall a more typical illustration of how scientific discoveries are made, we herewith give not only a picture of his most fruitful experiment, but also as brief an account of it as possible.

The object of this experiment was to determine how far the electrical virtue might

be carried; for, by previous experiments, he had discovered the fact that it could be conducted from one point to another. He used as the source of electricity a glass tube three and a half feet long and one and a quarter inches in diameter; both ends of the tube he closed with corks, to prevent dust from settling in the interior. The tube was simply held in the hand and rubbed with a



STEPHEN GRAY EXPERIMENTING.

piece of cloth. Through the cork at the lower end he inserted a piece of hempen packthread 147 feet long, with an ivory ball attached to the distant end. The packthread was supported on loops of the same material stretched across the long matted gallery of his house, from nails driven into the opposite walls. On rubbing the tube, he found that the ivory ball did not attract or repel a feather. The hempen loops broke under

the weight of his long packthread, and he substituted *silk* threads as being stronger. Now, however, on rubbing the tube, the ivory ball did attract and repel the feather. This experiment was made July 2, 1729, and he had thus virtually *constituted for the first time an electric telegraph* by demonstrating the conductivity of electricity. Lengthening his line, the silk threads also broke under its weight, and he substituted thick *brass* wires. But now, rub as vigorously as he might, not the slightest manifestation of electricity appeared at the ivory ball, and just here comes in the true inductive philosopher, who challenges every new phenomenon under altered conditions, asking why this, and, why not that? Gray concluded that the wire carried off the electricity, and that it was not the *smallness* of his silk supports, but their *nature*, which caused the former experiment to succeed and this one to fail. He pursued this idea through a long series of experiments, and thus established the facts of electrical conduction, and its opposite of *insulation*—that is to say, he found that some bodies allow electricity to pass through them, and others do not. One experiment made by him, and which was thought at the time to be extremely curious, was the suspension of a boy by ropes made of hair (insulating him), and, by merely bringing the excited glass tube near his feet, making his hair literally “stand on end.”

The last paper communicated by Gray to the Royal Society, was dictated by him on his death-bed to Dr. Cromwell Mortimer. Truly, Stephen Gray was a “most meritorious philosopher.”

WE learn that Boston is to be supplied with electric lights by Mr. H. B. Rankin, who uses the rising and falling of the water by ebb and flood to furnish the necessary power. The machinery is simple, consisting of a floss, to which barrels are tied; the fluctuation of the water moves the latter. The cost of this power is claimed to be seventy-five per cent. cheaper than any other.

Electrical Rapid Transit.

THE success of the London Underground Electric Railroad seems to have solved the problem of rapid transit in that busy city, and will undoubtedly be taken into consideration by the New York Central and Hudson River R. R., which has received permission to extend its line to the Battery, in New York City.

In Germany and Switzerland many experiments are being made in high-tension alternating currents.

The meeting of electricians in Berlin, Prussia, promises to be of great importance to the advancement of electrical industry in Europe.

In England, the introduction of the “Electric Messenger” Call Boxes is an assured fact, although the Post-Office Department, through Postmaster-General Raikes, opposed the efforts of the company by insisting that each letter carried should have a stamp on it; and a lawsuit is now in progress between the Post-Office Department and the American company.

When we consider that \$600,000,000 are invested in the manufacture of electrical appliances, and in the stock of the various companies, we have some idea of the magnitude of these industries which are changing daily the old methods connected with the generation of light, power and sound.

Electricity in Palestine.

AT Jerusalem an electric light plant is placed in a flour-mill situated near the supposed site of Calvary, and close to the Damascus Gate. The Arabs and Jews are puzzled to account for the light in lamps containing no oil, and keep at a respectful distance. Preparations to light the celebrated Cathedral of Durham, England, are in an advanced state. In Hungary, Spain and Germany similar steps are taken, and the prophecy that we should soon see electric plants on ocean steamers, is fulfilled, since the steamship recently launched in Glasgow, called *The State of California*, is fitted up with 330 incandescent lamps, each of 16-candle-power.

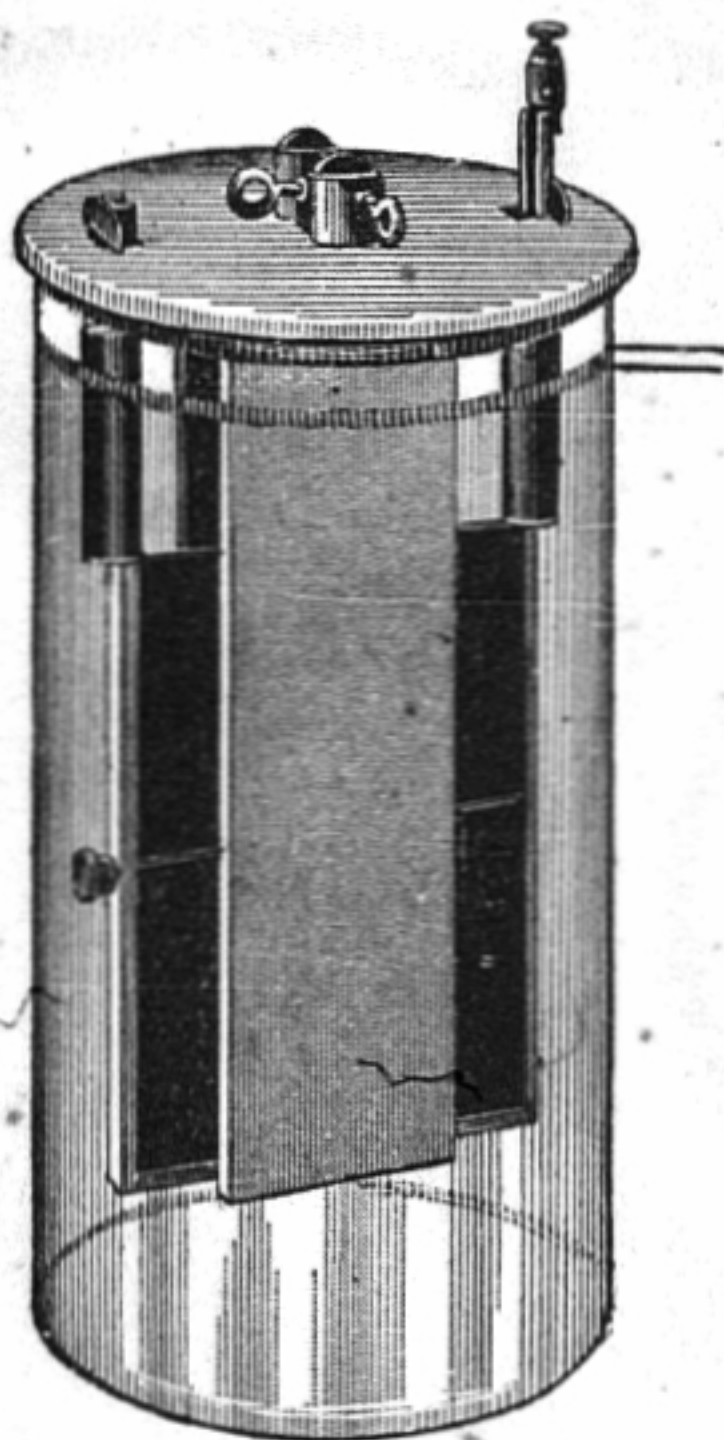
THE EDISON-LALANDE BATTERY FOR OPERATING THE PHONOGRAPH

THE EDISON-LALANDE Battery is a modification, or, rather, a development of the battery invented some years ago by Messrs. De Lalande and Chaperon.

Mr. Edison, being persuaded of the important electrical qualities possessed by this

cell has been subjected to a number of stringent tests, doing hard and continuous work on the lines of telegraph, railway and telephone companies.

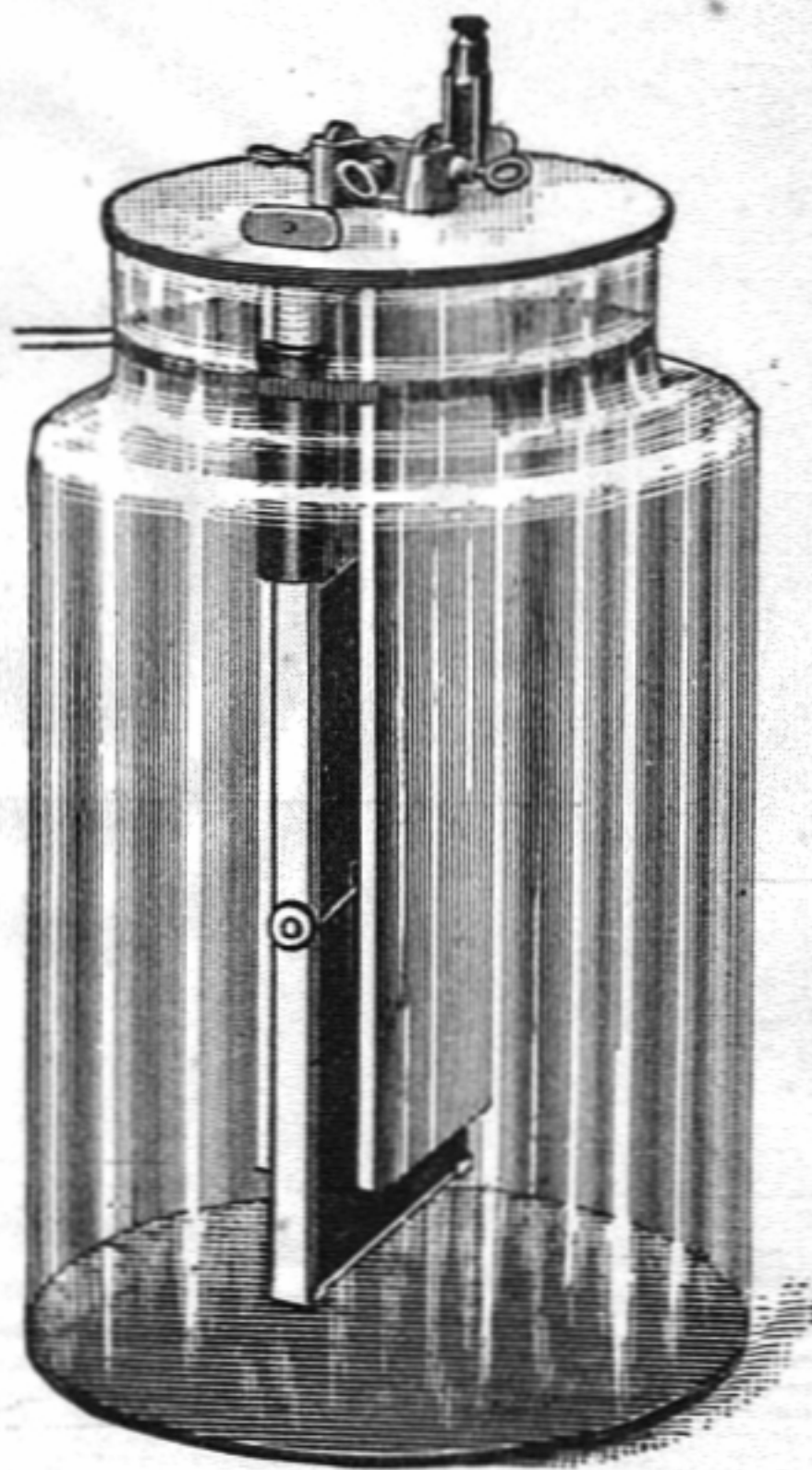
In telegraphy the EDISON-LALANDE Battery takes rank close to the dynamo. From a single group of cells almost any number of main line wires can be operated, while eight or ten local sounders can be worked from a battery of only two cells, thus economizing space, and reducing greatly the cost of labor connected with maintenance.



TYPE K.

type of battery, has recently conducted a long series of costly experiments with it, and has succeeded in perfecting a cell which combines the simplest mechanical arrangements with the fulfilment of all the requirements of a satisfactory galvanic battery.

The most remarkable properties of the EDISON-LALANDE cell are its extremely low internal resistance, and its great constancy, combined with the almost entire absence of local action, the loss by local action being less than one-half of one per cent., and internal resistance of the 300 ampere-hour cell being *only .025 of an ohm.* The EDISON-LALANDE



TYPE P.

In telephony, as being the next application of electricity in order of importance, the EDISON-LALANDE Battery, because of its extremely low and constant internal resistance, adds materially to the efficiency of

the transmitter. With the long-distance transmitter the internal resistance of the battery is an even more important factor, as the variation between the maximum resistance of the primary circuit is greater.

In the household, operating electro-medical apparatus, annunciators, bells, etc., it may be said to have no equal.

The small electric motor, adapted for driving sewing-machines, dental engines, lathes, ventilating fans, and numerous other contrivances needing a small amount of power, has a vast future before it, and its field of application is widening and extending every day.

Here once more the EDISON-LALANDE Battery comes to the front. On account of its low internal resistance and great constancy, it is particularly well adapted for small motor work, such as that which we have outlined above.

Electro-plating is another large field in which the EDISON-LALANDE Battery will no doubt find many patrons, who will hail its appearance, and, still more, its performance, with delight. Its sphere of service and influence is illimitable. It can be used with equally good results on closed-circuit and on open-circuit work. It will furnish heavy current, or otherwise. In a word, whatever class of work it is used for, it will comply with all conditions of efficiency, economy, and constancy.

The cuts shown above are types—"K" cell, especially adapted to the (phonograph) capacity, 300 ampere-hours, and type "P"

cell being adapted for electric lighting and telegraph "locals"—capacity, 600 ampere-hours.

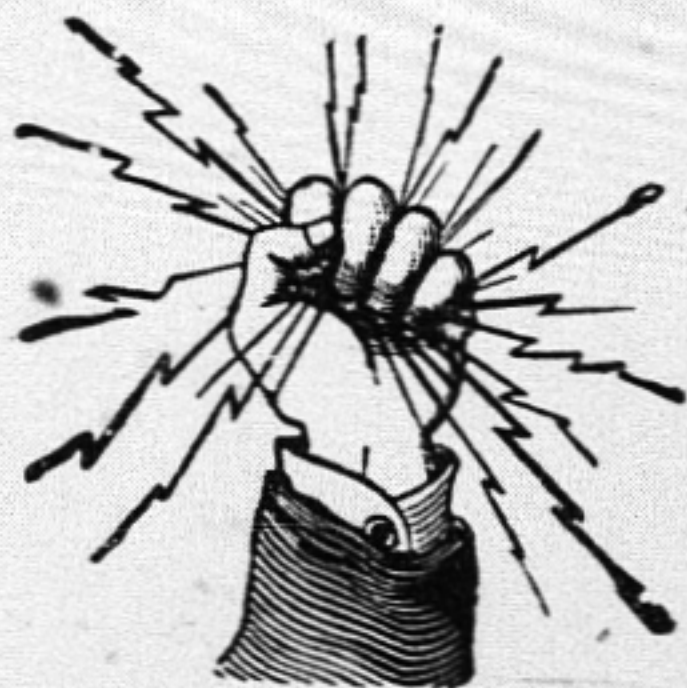
In a word, the EDISON-LALANDE cell is destined to be recognized as the primary battery *par excellence*.

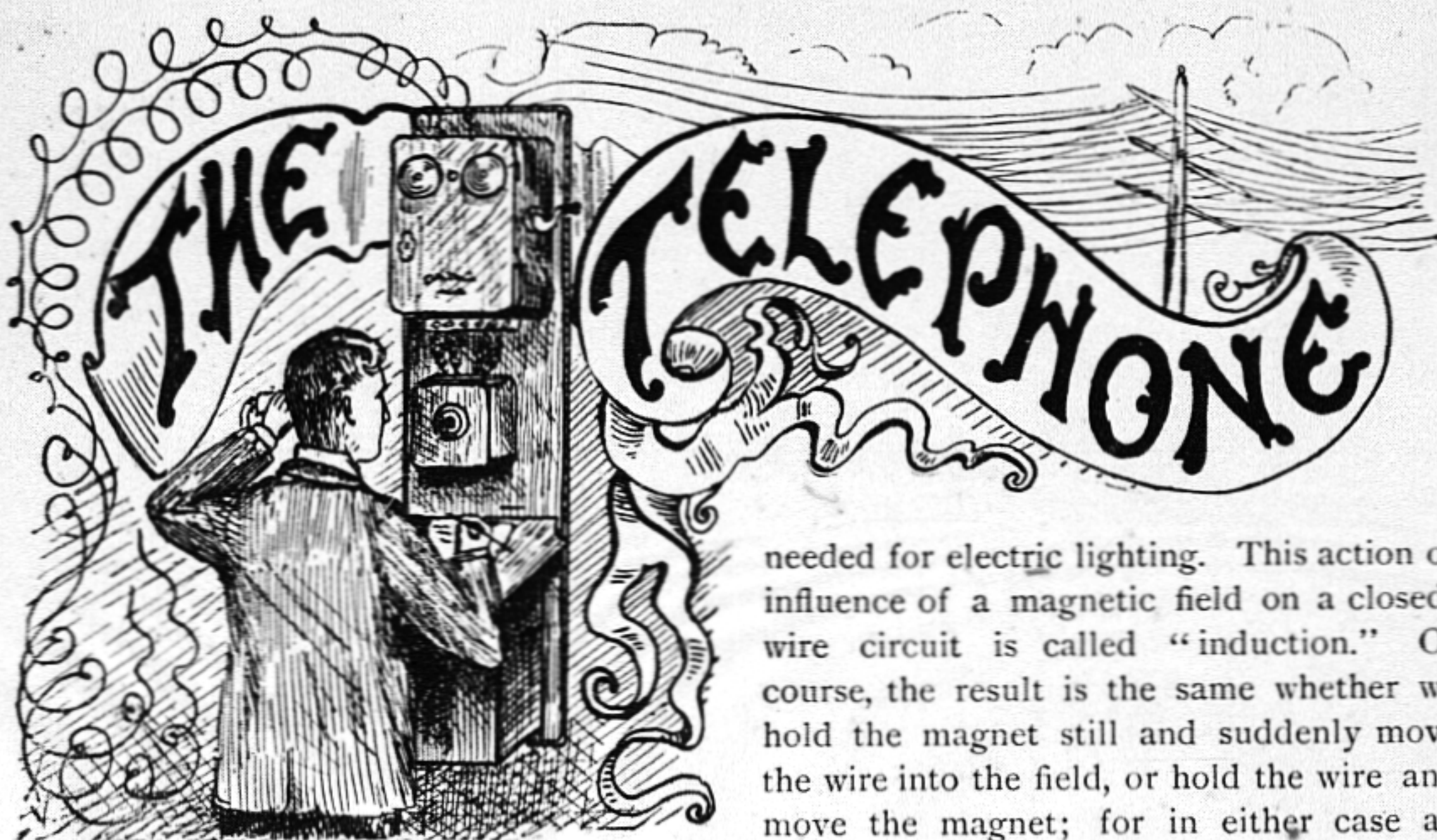
The Pumpelly Storage Battery Co.

PURSUANT to a resolution of the Board of Directors, the assets of the Pumpelly Storage Battery and Electric Motor Co. were sold at auction on April 30, 1891, at 10 o'clock, A. M., at the east front of the Springer Building, Nos. 205 and 207 South Canal Street., Chicago, Ill. The property sold consists of the patents, bills and accounts receivable, machinery, and all other property and rights of the company of every kind. A reorganization will take place at once.

The "Berliner Gramophone."

THE "Berliner Gramophone" is one of the latest inventions for recording speech. It is an instrument for making a phonographic record on a flat circular disk, instead of on a cylinder, so as to give a record that is easily mailed. The plate is revolved on a turntable, and the record is drawn in continuous line, a spiral line, beginning at the centre, and running out to the edge of the plate. This record is deepened by etching with acids. The inventor, Mr. Berliner, after long investigation, discovered a process for accomplishing this result, so as to get a permanent record on a metallic surface without subjecting the recording instrument to the resistance which would be necessary if it were required to make the record directly from the weak vibrations produced by the voice.





THE TELEPHONE.

BY ALEXANDER JAY WURTS.

SOUND is not transmitted over a telephone wire. This is probably news to most of those who daily use this wonderful instrument. A telephone, strictly speaking, is an electric generator at the transmitting end, and an electric motor at the receiving end.

In order to understand how speech can be transmitted over a telephone wire, we must have a little knowledge of induction, that is, the effect that a magnet can have on a wire or coil of wire, and the effect that a current flowing through a wire or coil of wire can have on a magnet.

Every magnet is surrounded by a "magnetic field," consisting of "lines of force." These lines can be made visible by placing a magnet under a pane of glass, and then sifting fine, soft iron filings over the glass.

If a closed-wire circuit be suddenly brought into such a magnetic field, so as to cut these lines of force, an electric current will be induced or generated in the wire. This is what takes place in every dynamo-machine to produce the powerful currents

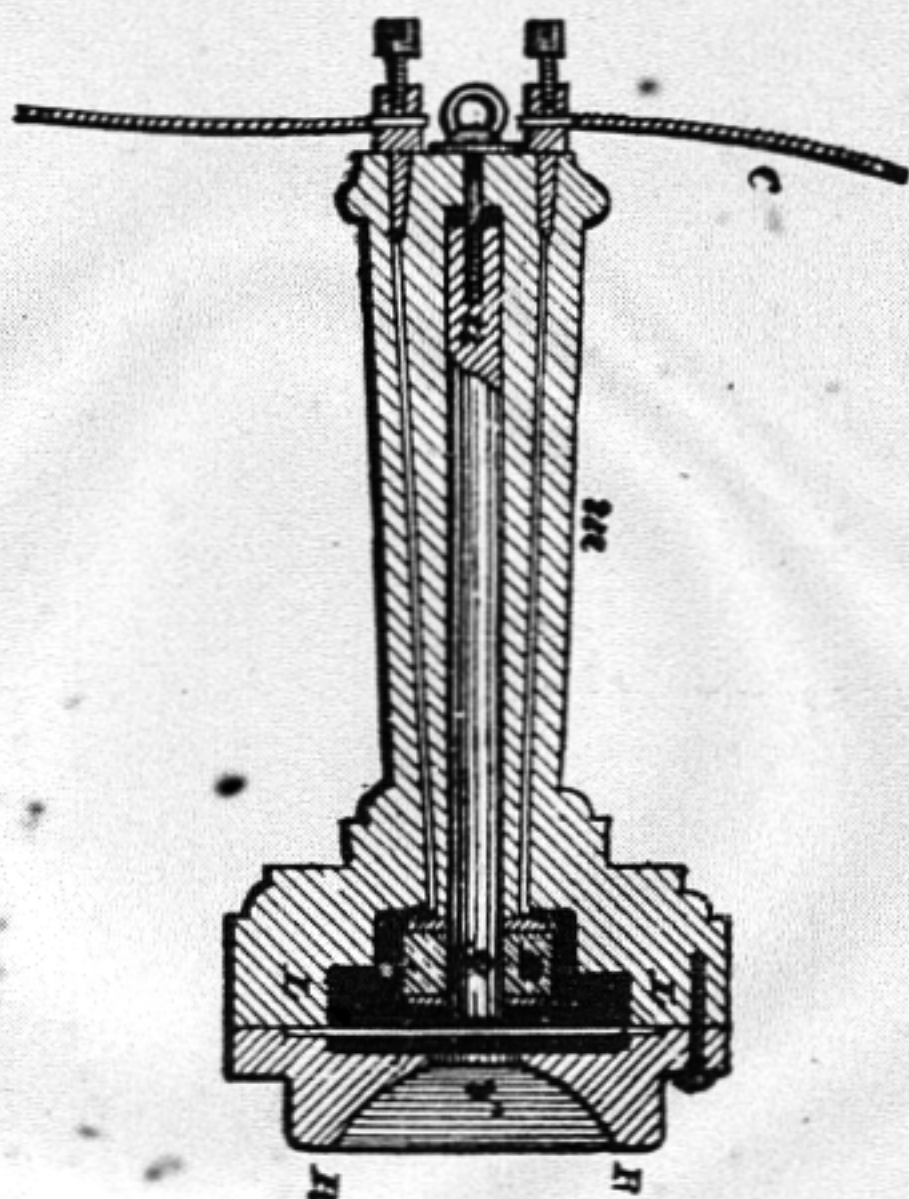
needed for electric lighting. This action or influence of a magnetic field on a closed-wire circuit is called "induction." Of course, the result is the same whether we hold the magnet still and suddenly move the wire into the field, or hold the wire and move the magnet; for in either case an electric current will be induced in the wire. However, as we shall presently see, it is not necessary to move either the magnet or the wire, in order to generate this induced current.

In moving the wire toward the magnet we have changed its position from a weaker to a stronger magnetic field: this fact caused the induced current—nobody understands the reason for it. If, now, we hold the wire and the magnet near together, and then, by some means, suddenly weaken the magnet, we shall have accomplished the above conditions of changing the wire from one strength of field to another, but in this case without any motion of the parts. If the magnetic field is suddenly made weaker, the current will be in one direction; if suddenly made stronger, the current will be in the opposite direction. However, this current is only an electric impulse, the current lasting during such time only as the strength of field is changing.

The strength of a magnet can be increased by bringing a piece of iron near it. It can be weakened again by removing the iron. A magnet can also be strengthened or weakened by allowing an electric current to flow around it in one direction or the other. Let us now put these ideas together, and then we shall have a telephone. The figure shows

the construction and a section of Bell's first telephone.

SN is a steel magnet, around one end of which is wound a coil of fine wire, *B*. The magnet and coil are inclosed in a wooden case, *MRR*. Across the end *S* of the magnet a diaphragm of thin sheet iron, *LL*, is fixed so that it just does not touch the end of the magnet. *CC* are the wires leading from the coil *B*, to the telephone wires. The action is as follows: When we talk



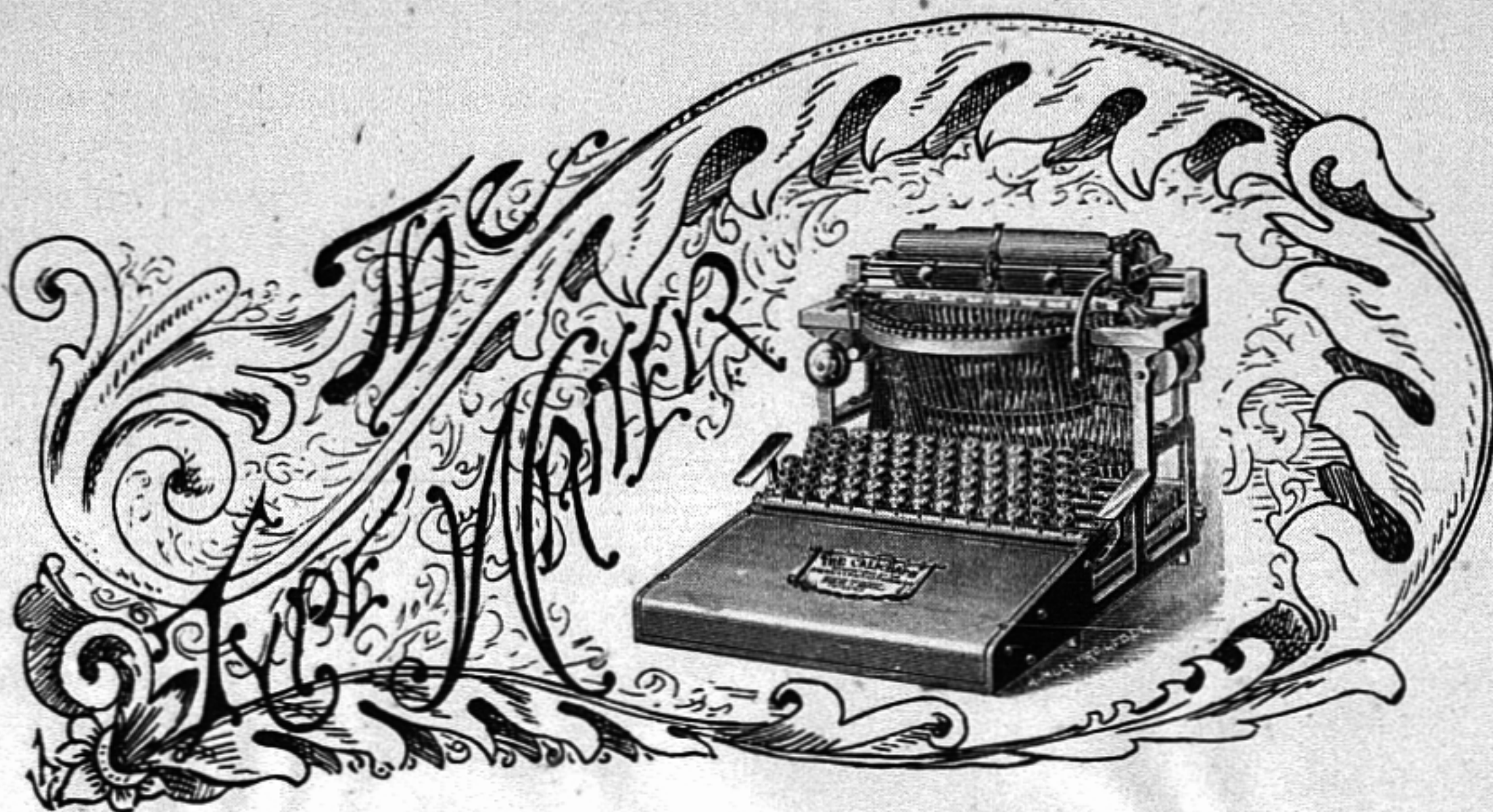
against the iron diaphragm, the sound vibrations of the air cause the diaphragm to vibrate with the vibrations of the air; that is, the diaphragm is caused to move to and from the magnet. This vibratory motion is, then, moving iron near the magnet, which we have seen strengthens the magnet; and moving iron away from the magnet, which we have seen weakens the magnet. We thus have a constantly changing magnetic field. And, as above shown, each change will induce an

electric impulse or current in the wire wound on the end of the magnet. The many turns of wire are simply intended to increase the effect. We have also seen that if the magnetic field changes from weak to strong the current will be in one direction, and *vice versa* if the conditions are changed about. If, then, the diaphragm is set in vibration, an alternating current will be induced in the coil.

If, now, the ends of this coil are connected to the coil of another just such instrument some miles away, these induced, alternating electric impulses will travel over the wire to telephone number 2, and, according to the direction of each impulse, will then slightly magnetize or demagnetize the magnet of this telephone. That is, the changes in the magnetism of telephone number 2 will correspond exactly to the induced electric impulses generated at telephone number 1. And, finally, the iron diaphragm of number 2 will be attracted or repelled, according as the magnetism there changes from weak to strong or strong to weak. In short, the diaphragm will vibrate, and cause the air surrounding it to vibrate, and thus reproduce the sound which had its origin at telephone number 1.

It will now be understood, how that no sound has been transmitted over the wire, in the sense of sound being transmitted through a speaking-tube. The energy of the mechanical motion of the air is transformed into electrical energy at the transmitter. The transmitter is, therefore, an electric generator. At the receiver these conditions are reversed, and electrical energy is transformed into the energy of mechanical motion of air. The receiver is, therefore, an electric motor.

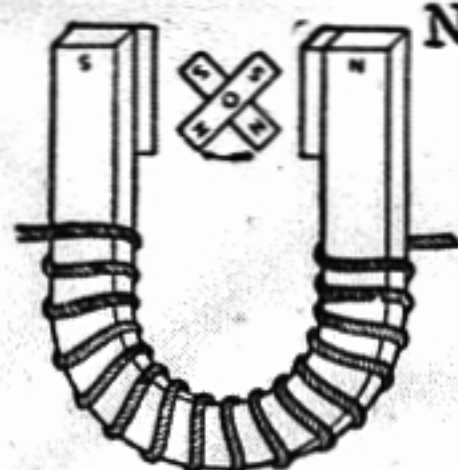




TYPEWRITER MECHANICS. "SHIFT-KEY OR NO SHIFT-KEY—WHICH?"

BY E. S. O.

NO. 2.



UNTIL within a very few years it has been claimed that the mental effort required to learn seventy-six separate keys on a typewriter keyboard is too much of a strain. Add to this the extended ground to be traveled in the operation of that number of keys, and you have the two salient objections to a machine which uses a type-bar for every character. The only offset to these objections has been what is known as the "shift-key." The presence of this key is, in effect, the presence of a duplicate keyboard. It governs thirty-six keys, giving to each type-bar two characters.

The question now arises, "Is the mental effort required to learn seventy-two characters any greater than the effort involved in remembering, at the proper time and place, how a capital should be produced by the operation of a shift-key?" Decidedly not, now that the more modern machines are adopting what is known as "the universal keyboard."

The history of the keyboard of the

original typewriting machines, as presented to the public for several years past, is one that is very little understood by typewriter users of to-day. The arrangement of the keys on the old style machines was no accident. Doubtless some of the combinations of letters might have been changed with advantage during the earlier stages of typewriter manufacture, but their constant use has put it beyond the advisability of changing their order now; hence the old style of keyboard duplicated so as to produce "upper" and "lower" case letters by separate keys and type-bars is now, without doubt, the only true model for a practical typewriter keyboard.

"WHY IS A SHIFT-KEY NECESSARY?"

Manufacturers of some of the original typewriting machines have argued for and against this principle. The truth in a nutshell is this: the power used to carry a type-bar (in type-bar machines) to its point of operation is a lever. Inasmuch as keyboards embrace several rows or banks of keys, the levers, operating from each bank, differ in length from those of their neigh-

bors. The fewer the number of banks, therefore, the less difference will there be in the length of levers, and *vice versa*. Mechanically, a short lever requires greater power to operate than a long one, and the greater the difference in length, so much the greater difference in power required. To offset this, some machines utilize the shift-key; therefore, so long as levers are used in typewriters the greater wisdom will retain the shift-key.

But is there no other means by which this one key can be done away with? Every operator knows that it requires more than three times the force to operate the shift-key that is demanded by any other on the keyboard, and unless operated with great precision it will spoil the appearance of an otherwise well-written letter by producing the "upper case" characters out of alignment with the "lower case" type.

As long as levers are used it is folly to increase the size of the keyboard from thirty-six to seventy-two keys; but the latest improved typewriters have overcome the lever difficulty and the shift-key abomination by the use of a simple "rock-shaft," the keyboard operation of which is absolutely uniform throughout its entire number of keys.

Illustrative of this, take three lead pencils and lay them on a table side by side; stick a pin in each of them at any point you please, and find, from this simple experiment, whether it takes any more effort to rock one than another, be it the shortest or the longest. Extend this illustration to any length you please, and the principle is the same: the "rock-shaft" calls for uniform power, no matter what the difference in length of the shafts.

In watching the progress of science one is forcibly impressed with the fact that the march of improvement lies in this—"Reverse the Past." Confining this idea to typewriters alone, what has "Improvement" done? One Company's watchword is "To save Time is to Lengthen Life." That is be-

cause there were no competitors at the time that saying became associated with this line of business. The first competitor adopted the following motto:—"It stands at the Head." Now we see, "Improvement the Order of the Age," and in closely scrutinizing the improvements claimed by the Company using this last, we find the exact reverse, in many ways, of the principles of the older machines. Perfection may not yet have been reached in the wonderful science of invention; and the typewriter of to-day may be superseded by others whose principles shall vie with those who claim "Perfection" in this our generation; but if the great things of this world have been achieved by reversing the principles of the less, the public has within its grasp the mechanical skill, as applied to typewriters, which will convince the most skeptical that monopolies (in that line of business at least) are dead.

A Typewriter's Blunder.

AN important suit was brought lately in involving the alleged omission of two words: "try and." It is claimed these words were left out of a contract made by Stephen Clifton, Jerome J. Danforth, and Austin W. Granville. Austin and Danforth were to "try and sell" a piece of property for Clifton. The typewriter, in writing out the contract, left out the words: "try and."

No sale was effected, and Clifton brought suit to recover \$150,000 for breach of contract, based on the claim they did not find purchaser under the contract, which, with the two words omitted, bound them to sell the property.

The case is about to come to trial, and this peculiar question will probably set an example to typewriters to be more careful in the future. Defendants say they cannot set up their defense at law, and the court is asked to restrain the prosecution.

-Phono-Chat-

THE New England Phonograph Company have, during the past month, been doing some very novel advertising with the phonograph.

Mr. Prescott, manager of the "Ship Ahoy" Company, playing a very successful engagement at the Park Theatre in Boston, of over three months' duration, conceived the happy idea of having the principal songs and choruses sung to the phonograph, and then the machine placed in the lobby of the theatre during the daytime, and free exhibitions of these songs given to the public. In consequence thereof, the chorus and the principal singers of the company visited the rooms of the New England Phonograph Company, and sang quite a number of selections, and the same were reproduced in the lobby of the theatre, causing a great deal of attraction and much newspaper comment.

A marked increase was also noticed in the attendance at the theatre, from the novel mode of thus advertising the latest operatic novelty, "Ship Ahoy."

ANOTHER interesting fact may be noted, that after an exhibition which was given in Gardiner, Me., in the early part of this month, by Mr. C. G. Child, of this company, on his way home in a Pullman car, which was traveling at the rate of forty miles an hour, he took his phonograph out from his case and set it up, and gave an exhibition to several of the passengers, and also made a record upon the cylinder, which was as nearly perfect as any record taken with the machine on *terra firma*.

This goes to show that the phonograph is a practical machine, to be used anywhere.

AT Melbourne, Australia, Prof. Ducarron has been giving exhibitions of the Edison phonograph with great success. The machine and cylinders, which were sent out by the California Company, are also used with a waxworks entertainment.

THE Louisiana Phonograph Company are doing a rushing business; the novelty of hearing a machine talk, and the endless variety of amusement afforded, keep the room crowded from morning till night. Not long since, a rich old New Yorker, who dreaded that his will would be contested and his estate eaten up by costs and fees long after his death, dictated his last testament to a phonograph, adding, as he did so, "If there is any doubt as to what I meant by this will, let them

take out this phonograph and see how I emphasized it."

THE PHONOGRAM has received an interesting letter from the "Soros Club," Bombay, India. The club has over 200 members (native women). "One of the efforts to interest and help the members and their families, is a circulating library, and we appeal to the liberal publishers to send us a copy of their magazine or paper to help on the good work." The letter is signed by E. Brainerd Ryder, M. D., Pres., and Frances S. Abdulla, Sec.

AT a meeting of the New York County Medical Association, held April 20th, an interesting paper on "The Phonograph and Micro-Graphophone in Medical and other Sciences," was read by J. Mount Bleyer, M. D. Discussions by Drs. J. R. Leamington, L. L. Seaman and H. S. Oppenheimer; and, by invitation, T. A. Edison, Esq., and Lieut. Bettini.

AN Edison phonograph was on exhibition lately at Kingston, Ont., in the British American Hotel, and many citizens listened with delight to the selections of band and vocal music heard through the tubes as realistically as though close at hand. The wonderful instrument is in charge of W. F. Lipsett.

THE people of Auckland, New Zealand, have been enjoying a series of exhibitions of the phonograph. At the last affair Sir George Grey spoke into the instrument a message to the citizens of Auckland, to be preserved in the Free Library of the city. This is the first time such a public record has been made in any city of the Southern Hemisphere.

AT Bradford, England, a series of entertainments with the phonograph was given under the direction of Mr. C. R. C. Steytler, of the Edison United Phonograph Company. Wax cylinders, on which 200 successive records had been taken, were used.

PROF. ARCHIBALD'S lectures with the Edison phonograph are delighting and instructing large audiences in New Zealand. The local press claim that the invention will cause a complete revolution in business methods.

THE New York Phonograph Co. are extending their business considerably, and have opened a temporary office in the Pulitzer Building, where attention is given to placing the phonograph in down-town business houses. This is a wise move on their part.

TESTIMONIAL LETTERS FROM OFFICERS OF THE PHONOGRAPH COMPANIES OF THE UNITED STATES.

IN ORDER TO SHOW THE CHARACTER OF THE WELCOME ACCORDED TO "THE PHONOGRAM," WE PRESENT THE FOLLOWING EXTRACTS FROM SOME OF THE MANY HUNDRED LETTERS RECEIVED SINCE THE ISSUE OF THE FIRST NUMBER.

CHICAGO CENTRAL PHONOGRAPH Co., }
CHICAGO, ILL., April 18, 1891. }

Enclosed please find check for March number of THE PHONOGRAM. Please put us down on your list as regular subscribers.

Yours very truly,

W. S. GRAY, Gen. Mgr.

NEW ENGLAND PHONOGRAPH Co., }
BOSTON, MASS., May 2, 1891. }

We commend the magazine for the month of March, and think it a great step in advance, and trust that you will go on to improve it.

We are yours very truly,

AUG. SAMPSON, Gen. Mgr.

THE MONTANA PHONOGRAPH Co., }
HELENA, MONTANA, May 1, 1891. }

I received a copy of the February issue, and, after looking it through, I thought it had more good, interesting things in it than any journal of the same size I had ever seen. There is not an article in it that is not interesting to one interested in the invention and improvement of labor-saving machinery; in fact, the journal is full of interest to everyone, no matter what his occupation. May THE PHONOGRAM grow and prosper with every issue.

Very respectfully,

G. W. WALTERS, Supt.

GEORGIA PHONOGRAPH Co., }
ATLANTA, GA., April 18, 1891. }

The March number of THE PHONOGRAM duly reached me, and was read with much interest. Allow me to take this opportunity of offering my congratulations upon its rapid advancement. I feel sure that it will prove a great advantage to the phonograph business, and a powerful ally.

Very truly yours,

F. WOHLGEMUTH, Gen. Mgr.

LOUISIANA PHONOGRAPH Co., }
NEW ORLEANS, LA., April 28, 1891. }

Please find check from the Louisiana Company. We cannot use a larger number of THE PHONOGRAM just at present, as we are but getting under way. We hope, however, soon to increase our order. With best wishes for THE PHONOGRAM,

H. R. CONYINGTON, Secy.

KENTUCKY PHONOGRAPH Co., }
LOUISVILLE, KY., May 1, 1891. }

We are, so far, very much pleased with THE PHONOGRAM.

Yours truly,

GEO. W. GRANT, Sec'y and Treas.

ARKANSAS EDISON PHONOGRAPH Co., }
LITTLE ROCK, ARK., April 29, 1891. }

Enclosed find clipping of the *Arkansas Gazette* of April 27th, containing an item that may be of interest to the readers of THE PHONOGRAM. You may add that the Arkansas Company have placed machines in Little Rock, Hot Spring, Fort Smith and Pine Bluff, and are placing them in other places as fast as we can get them. Wishing THE PHONOGRAM success, as it is necessary for the future of the phonograph,

Very truly yours,

ARKANSAS EDISON PHON. Co.

MR. EP. WOOD, of the Arkansas Edison Phonograph Co., took the speeches of Gov. Eagle and President Harrison as published in *The Gazette* and the Associated Press by phonograph, and then transcribed them on typewriter and had them ready in advance of the other copy. As a speech-taker the phonograph is great.

THE NATIONAL ECONOMIST,
Official Organ
of the

NATIONAL FARMERS' ALLIANCE
WASHINGTON, D. C., May 11, 1891.

COLUMBIA PHONOGRAPH COMPANY,

Washington, D. C.

GENTLEMEN: We have two phonographs in our office, one used for transcribing, the other for dictation.

They work very satisfactorily, and we would not be without them. We find that dictations are transcribed more accurately than is usually the case in ordinary stenographic work.

We think no business office is complete without a phonograph to carry on the correspondence.

Yours truly,

THE NATIONAL ECONOMIST.

OFFICE OF THE B. & O. R. R. Co., }
BALTIMORE, MD., March 20, 1891. }

COLUMBIA PHONOGRAPH Co.,

Baltimore, Md.

GENTLEMEN: I use the phonograph for dictation purposes, and it has proven very satisfactory. My secretary has a great deal of routine work, which he now can do while I am dictating to the machine, thus saving much time. I find it a very valuable adjunct.

Respectfully yours,

CHAS. SELDEN,
Supt. of Telegraphs.

PARIS, TEXAS, March 3, 1891.

Editor PHONOGRAM:

Dear Sir:—I am in receipt of Vol. No. 2 of your magazine. I do not know to whom I am indebted for it, but am very highly pleased with its make-up, and think a man using the machine would be glad to have it. I used the phonograph for two years and have had a practical experience with it in all its various uses. The way I used it for court reporting here was: I had a man of fine hearing (I being partially deaf), to sit and repeat in a moderate tone all that was said, giving, of course, the names of speakers, and we found it worked entirely to the satisfaction of all concerned. We reported in the U. S. Court for the Eastern Dist. of Texas the celebrated "No-Man's-Land" murder case, tried here at the last term of court. They also had a shorthand man, and the two reports were essentially the same.

Hoping your magazine success, and I know it fills a want, I am yours truly,

H. L. EWING.

THE PHILADELPHIA TRUST, SAFE DEPOSIT
AND INS. CO.,

413, 415 and 417 Chestnut St.

PHILADELPHIA, PA., Jan. 6, 1891.

EASTERN PENNSYLVANIA PHONOGRAPH CO., PHILADELPHIA, PA.

Gentlemen:—I have been making use of the phonograph for eighteen months, and am glad to be able to say for it that it is entirely satisfactory, and completely takes the place of a stenographer or shorthand amanuensis. The manipulation of it is simple and without any annoyance or trouble to the one dictating, and with the recent improvements added to the machine the reproduction of the voice is perfectly distinct, so that the transcribers from its dictation find no difficulty in their part of the work. I believe that if the business public could only become properly acquainted with the merits of the machine, and the ease and comfort with which it can be operated, it would come to be regarded as an indispensable part of the equipment of every well-appointed counting-room and office, and I sincerely hope for it the universal use to which its practical qualities entitle it.

Very truly yours,

W. L. DuBois.

LACKAWANNA LINE—FAST FREIGHT,

W. H. SMITH, Manager, Buffalo, N. Y.

L. E. SNIVELY, Agent, N. W. Cor. 3d and Chestnut Sts.

PHILADELPHIA, Pa., Jan. 16, 1891.

EASTERN PENNSYLVANIA PHONOGRAPH CO., PHILADELPHIA, PA.

Gentlemen:—In reply to your inquiry, I can but admit that the phonograph is certainly a great improvement over the customary manner of treating correspondence by stenographic dictation.

The phonograph is unlimited as to speed, is absolutely correct in the transcription, and so easy to operate that any boy who can use the typewriter is all that is required in the most complicated correspondence, to transcribe verbatim.

I feel that a trial will convince most any person of these facts, and I take pleasure in recommending it to any one.

Yours truly,

L. E. SNIVELY.

U. S. SENATE, WASHINGTON,
D. C., March 5, 1891.

COLUMBIA PHONOGRAPH CO., WASHINGTON, D. C.

Gentlemen:—I am about to leave Washington for the recess, and the instrument is subject to your order. *I shall want it again when I return.*

Yours very truly,

JAMES K. JONES.
(U. S. Senator.)

WASHINGTON, D. C., Feb. 13, 1891.

E. D. EASTON, Esq., President Columbia Phonograph Co., Washington, D. C.

Dear Sir:—Perhaps it will be interesting to you to know what my experience is with the phonograph. I have had two of these wonderful instruments in my office for the last two months.

I used them entirely for business purposes, and am frank to say that as a time and money saver they have no equal in the world, so far as my knowledge extends.

The phonograph is worth more to any one who has a large correspondence than any two stenographers I ever saw. I come into my office in the morning, and if I have a dozen or fifty letters to write I sit down for half an hour or more, as the case may be, and talk to my phonograph; then I go about my business. My typewriter operator comes in, takes the cylinders which I have filled, puts them on her instrument and transmits them to paper on her typewriter with much greater facility than she could possibly do from verbal dictation. In short, it is only necessary to test the phonograph for business purposes to determine its vast usefulness. Very truly yours,

J. DANIELS,
Atty. at Law.

PROVIDENCE, R. I., Feb. 11, 1890.

NEW ENGLAND PHONOGRAPH CO., BOSTON, MASS.

Gentlemen:

In reply to your letter of this date asking my opinion of the phonograph, I would say that I have used one in the regular correspondence of this office since the 14th of January.

In my opinion it is a thoroughly practical and time-saving instrument for office use.

It can be operated with speed and certainty by persons having the amount of mechanical knowledge usually possessed by office employes.

As a substitute for a Stenographer it is entirely satisfactory in my opinion. One of its special merits is, that one does not have to wait for the phonograph to return from dinner before a dictation can be given; nor is it liable to have to stay away from the office on account of sickness.

A very practical feature of the phonograph is, that one can read the stenographic notes made by it; but a dictation to a Stenographer leaves one entirely at his mercy in any question as to the accuracy of the notes.

The wax cylinder gives the most positive proof, and must immediately settle any dispute of this nature. The typewriter operator can write a letter from the phonograph in a much shorter time than from notes, for the eyes have only one duty to perform—the ears, as they should, doing their part of the work.

Yours truly,

EDWARD S. JONES.

AUTHORS AND PUBLISHERS.

LECTURES ON THE ELECTRO-MAGNET, by Sylvanus P. Thompson, D. Sc., B. A., F. R. A. S. Authorized American edition. Pp. 287. New York: The W. J. Johnston Co., Ltd., 1891.

This is the book on the subject, and the subject is of prime importance. As the author says—and no one is higher authority—"the dynamo for generating electric currents, the motor for transforming their energy back into work, the arc lamp, the electric bell, the telephone, the recent electro-magnetic machinery for coal-mining, for the separation of ore, and many other electro-mechanical contrivances, come within the purview of the electrical engineer. In every one of these, and in many more of the useful applications of electricity, *the central organ is the electro-magnet.*" Every electrical engineer, therefore, needs just such a book, and he will find the whole subject treated in these pages in a clear, original, thorough and masterly way. It is a practical working manual, and worth many times its price.

There are 74 illustrations, which add greatly to the text.

* * * *

APPLETON'S SCHOOL PHYSICS is in every way admirably adapted to the purpose of instructing the young, and, indeed, persons of any age who are unfamiliar with modern ideas and discoveries in natural philosophy. The different departments being entrusted to men who are experts in each branch of learning herein handled, shows that each subject is treated in the most thorough manner. Frictional and voltaic electricity are the work of Prof. Nipher, and magnetism and the practical application of electricity the production of Prof. Crocker. By their methods the student is inspired with enthusiasm in acquiring a knowledge of this great science, which he soon sees opens up a wide field for activity in many directions. By gradual steps he understands the relations of sound, heat and light to the steam-engine, the electric-light and battery, the dynamo, telegraph and telephone. All information is fresh, and in modern form.

* * * *

MANY of the entertainments given by the Royal Arcanum to its members and guests are enlivened by exhibitions of the Edison phonograph. The last exhibition, given by Fort Green Circle, of Brooklyn, N. Y., was such a success that it will be repeated in May.

M. HOSPITALIER'S ELECTRICIANS' POCKET-BOOK contains in this year's edition not only matter from former editions, but, in the part devoted to theory, an addition of valuable data on periodic currents. In the practical part, much is to be learned on the subject of specific resistance of metals, alloys and liquids; also the values of the principal magnetic constants of the steel employed in the manufacture of permanent magnets. New matter is presented on the distribution of currents, and many practical figures on the construction of dynamos, transformers, etc. It embraces information which we have not seen included in any single work written for this purpose.

* * * *

IN Toronto, Canada, a fine building is in course of completion which will hold another Edison plant, consisting of eight Edison dynamos—six of 1,000 sixteen-candle-power lights and two of 2,000 lights, these latter being the largest in the Dominion. These supply seventeen miles of underground wires already in operation, and ten additional miles will be finished this summer. The building itself will be of red brick with stone facings, and consist of five stories, with basement.

* * * *

The May number of the *Home Maker* has a delightfully illustrated article on "Some Old-time Jersey Weddings," beginning with the bridal of Lady Kitty Alexander, and followed by "Camera," illustrated by a number of distinguished amateurs, including Mr. Elbridge T. Gerry, Franklin Harper, Miss Catherine Reed Barnes, and others.

It is a very bright and interesting number.

* * * *

The *Cosmopolitan* offered recently \$200 for the best essay on "The Needs of the Farmer, His Hours of Labor and the National Legislation Necessary for His Prosperity." The prize awarded to Miss Abner L. Frazer, of Milford, O., was selected from a large number of manuscripts received from all parts of the country. Dan. C. Beard and F. F. G. Atwood, the celebrated cartoonists, have illustrated the article with pertinent subjects.

This essay will appear in the June number and should be read with interest by the large class who are interested in the farmers' political movement. Obtained from this office, price 25 cents, or with THE PHONOGRAM, \$2.40 a year.

SUPPLIES
FOR ELECTRIC LIGHT AND POWER;
ARC AND INCANDESCENT
INSTALLATIONS,
MEASURING AND TESTING INSTRUMENTS,
VOLTMETERS
AND
AMMETERS;
LINE WIRE UNDERGROUND CABLES, OFFICE WIRE,
MAGNET WIRE AND LAMP CORD,
INSULATORS—GLASS AND PORCELAIN,
FUSE WIRE,
SWITCHES AND CUT-OUTS,
SHADES AND
GLOBES.
INCANDESCENT LAMPS FOR ANY SYSTEM.
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ALEXANDER, BARNEY & CHAPIN,

GENERAL ELECTRICAL SUPPLIES,

Telephone Building, - - 20 Cortlandt Street,

NEW YORK.

ESTABLISHED HALF A CENTURY.

MARVIN'S
FIRE & BURGLAR
SAFES

HAVE MANY
PATENTED IMPROVEMENTS
NOT FOUND IN
OTHER MAKES
THAT WILL WELL REPAY AN
INVESTIGATION
BY THOSE WHO
DESIRE TO SECURE
THE BEST SAFE
MARVIN SAFE CO.
NEW YORK, PHILADELPHIA,
LONDON. ENGLAND.

The Commercial Advertiser.

NEW YORK.

A FAMILY NEWSPAPER.

Will Remove MAY 1, 1891,

—TO—

29 PARK ROW.

A NEW AUTOMATIC PHONOGRAPH.

In a few weeks the "Hartford Model Coin-operated Attachment for the Phonograph" will be placed on the general market. It has been evolved by long-continued trial in actual work and claims the following features:

1. It is entirely automatic; nothing is necessary but to drop the nickel.
2. Ease of attachment to the phonograph. One screw holds it in place.
3. Certainty of operation. It cannot catch, drag, or miss.
4. Smooth and noiseless return of the diaphragm arm, without jar or jerk.
5. As a consequence of the foregoing it cannot get reproducing point out of adjustment.
6. Dropping the nickel makes the electric connection, and the phonograph starts free without the least contact, friction, or impediment from the attachment.
7. Attractive cases, natural woods, large bevel plate-glass fronts; attachments all nickel plated.
8. It will be offered for sale at a moderate price, with no rentals, percentages, or share of the profits.

FULL ADVERTISEMENT IN THE NEXT "PHONOGRAM."

$\$2.40 + \$1.00 = \$2.40.$

LOOKS QUEER,

THE
PHONOGRAM
COSMOPOLITAN
MAGAZINE

But it's all right. No error in our arithmetic. We explain above problem thus: THE COSMOPOLITAN MAGAZINE costs \$2.40 a year; THE PHONOGRAM costs \$1.00; the two together would ordinarily cost \$3.40. We will send both publications, however—and they are the very best of their high class—for a whole year for the price of the magazine alone—\$2.40. You will never get a like opportunity again. It's a chance to be caught before it flies away with time. You know all about THE PHONOGRAM, and if you're not familiar with THE COSMOPOLITAN, send to the publishers for a free sample copy, addressing THE COSMOPOLITAN MAGAZINE, Madison Square, New York City.

THE PHONOGRAM will be sent to one address and THE COSMOPOLITAN to another if you like. Send all orders to

THE PHONOGRAM,

ROOM 87, PULITZER BUILDING,

NEW YORK.

BOTH FOR \$2.40 A YEAR.

MUSIC BY THE UNITED STATES MARINE BAND.

The Best Pieces (about a hundred different selections) played at the White House by the UNITED STATES MARINE BAND, kept constantly in stock.

JOHN Y. AT. LEE'S WONDERFULLY EFFECTIVE ARTISTIC WHISTLING, WITH PIANO ACCOMPANIMENT, TWENTY-ONE SELECTIONS.

The Loudest, Clearest, and Most Distinct VOCAL and ORCHESTRA, VOCAL and PIANO, VOCAL QUARTETTES, CLARINET and PIANO, and CORNET and PIANO ever offered. Unique AUCTION SALES of Twenty Different Kinds of Property Made by an Auctioneer.

SHAKESPEARIAN RECITATIONS. HUMOROUS RECITATIONS.

The conversational course of the Meisterschaft System, FRENCH, GERMAN, SPANISH, or ITALIAN, recorded on twenty-four cylinders for each language. Price of books and cylinders for a single language \$25.00, which includes right of correspondence with the author, Dr. Richard S. Rosenthal, correction of all exercises, and reply to all questions.

WE SELL MORE MUSIC THAN ALL OTHER DEALERS PUT TOGETHER!!!

Send for musical catalogues and price-lists; also circulars on the subject of language-teaching, with full particulars.

COLUMBIA PHONOGRAPH COMPANY,
No. 627 E St., N. W. WASHINGTON, D. C.

LADIES NEED NOT HESITATE



TO FREELY USE

AMBROSIA CREAM

To Remove Freckles, Blotches, in fact all
FACIAL BLEMISHES.

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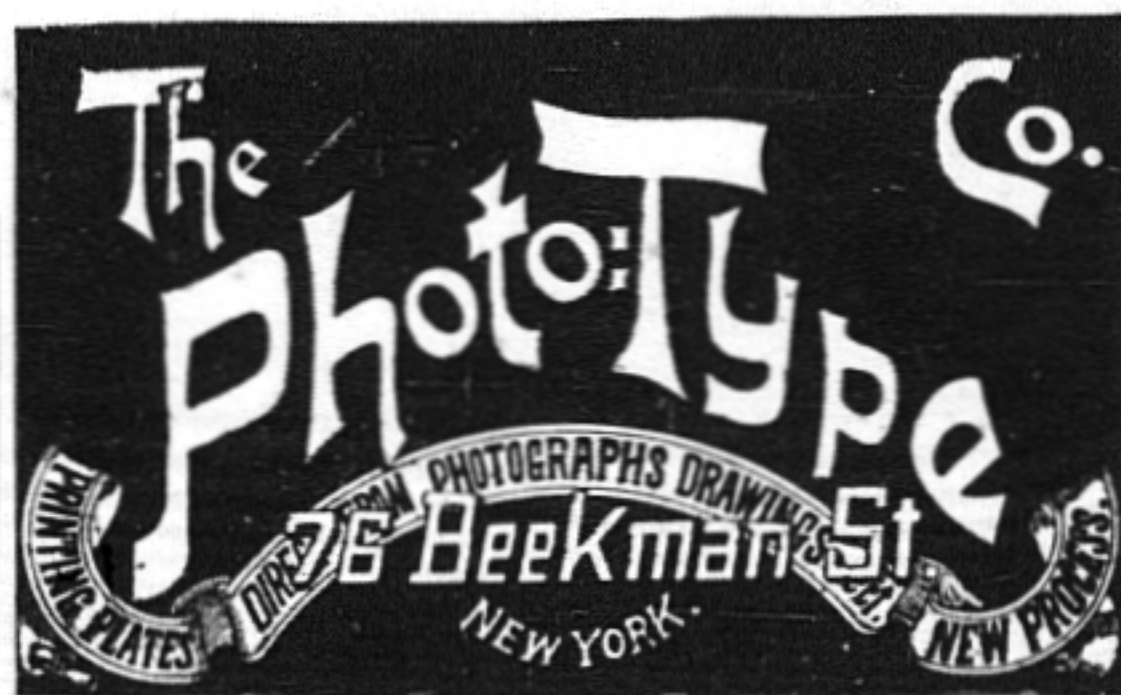
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